

Metropolitan Asylums Board.

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P. 7178

R E P O R T

OF THE

COMMISSIONERS APPOINTED TO ENQUIRE RESPECTING
SMALLPOX AND FEVER HOSPITALS.

PRESENTED TO BOTH HOUSES OF PARLIAMENT IN AUGUST, 1882.

[Reprinted by the Managers of the Metropolitan Asylums Board, March, 1886.]

LONDON:

MCCORMACK & CO., LIMITED, CARDINGTON STREET, HAMPSTEAD ROAD, N.W.

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COMMISSION.

VICTORIA R.

Victoria, by the Grace of God of the United Kingdom of Great Britain and Ireland Queen, Defender of the Faith.

To Our right trusty and well-beloved Councillor Frederic, Baron Blachford, Knight Commander of Our most distinguished Order of St. Michael and St. George; Our trusty and well-beloved Sir James Paget, Baronet; Our trusty and well-beloved Sir Rutherford Alcock, Knight Commander of Our most honourable Order of the Bath; Our trusty and well-beloved Arthur Wellesley Peel, Esquire; Our trusty and well-beloved Edward Leigh Pemberton, Esquire; Our trusty and well-beloved John Burdon Sanderson, Esquire, Doctor of Laws, Doctor of Medicine; Our trusty and well-beloved Alfred Carpenter, Esquire, Doctor of Medicine; Our trusty and well-beloved William Henry Broadbent, Esquire, Doctor of Medicine; and Our trusty and well-beloved Jonathan Hutchinson, Esquire, Fellow of the Royal College of Surgeons, greeting.

Whereas We have deemed it expedient that a Commission should forthwith issue to inquire respecting :

1. The nature, extent, and sufficiency of the hospital accommodation for small-pox and fever patients provided by the Managers of the Metropolitan Asylum Board and the several vestries and district boards in the metropolis, including the Commissioners of Sewers for the City of London.
2. The relative advantages and disadvantages to patients and the public of providing for small-pox and fever cases, whether amongst persons of the pauper class or persons of the non-pauper class without proper means of isolation, or both, by a limited number of hospitals for the whole metropolis under one authority, such as the Managers of the Metropolitan Asylum District, or by parochial and district hospitals under vestries and district boards.
3. The expediency of continuing the several existing small-pox and fever hospitals now under the Managers of the Metropolitan Asylum District; or, if it be considered desirable that any should be closed, the accommodation for small-pox and fever cases which should be substituted.
4. The expediency of the Managers of the Metropolitan Asylum District establishing additional hospitals and of making special provision for convalescent cases.
5. The conditions and limitations under which the hospitals provided by the Managers should be continued, and the general conditions and limitations which should be observed in the case of the establishment of new hospitals, whether by the Managers or any other authority, so as to insure, as far as practicable, the recovery of the patients and the protection of the public against contagion.
6. The operation of the Acts relating to the establishment of hospitals for small-pox and fever patients in the metropolis, and the provisions, if any, required for the acquisition of sites for such hospitals, whether by agreement or otherwise; and for the protection of the authorities providing small-pox and fever hospitals, subject to the same being conducted with reasonable care and according

to prescribed regulations, from liability to legal proceedings so as to secure the public against the loss of the benefits arising from such institutions ; and to make such suggestions as you may deem expedient in connection with all or any of the matters aforesaid.

Now know ye, that We, reposing great trust and confidence in your knowledge, ability, and discretion, have nominated, constituted, and appointed, and do by these Presents nominate, constitute, and appoint, you the said Frederic, Baron Blachford ; Sir James Paget ; Sir Rutherford Alcock ; Arthur Wellesley Peel ; Edward Leigh Pemberton ; John Burdon Sanderson ; Alfred Carpenter ; William Henry Broadbent ; and Jonathan Hutchinson to be Our Commissioners for the purposes of the said inquiries :

And for the better enabling you Our said Commissioners to make the said inquiries, We do by these Presents authorise and empower you, or any three or more of you, to call before you, or any three or more of you, such persons as you may judge necessary, by whom you may be the better informed of the matters herein submitted for your consideration, and every matter connected therewith ; and to inquire of and concerning the Premises by all lawful ways and means whatsoever ; and also to call for and examine all such books, documents, papers, or records as you shall judge likely to afford you the fullest information on the subject of this Our Commission ; and to inquire of and concerning the Premises by all lawful ways and means whatsoever :

And We do further by these Presents authorise and empower you, or any three or more of you, to visit and personally inspect such places as you may deem expedient for the more effectual carrying out of the purposes aforesaid :

And Our further will and pleasure is that you, or any three or more of you, do, with as little delay as possible, report to Us under your hands and seals upon the matters referred to you as aforesaid ; and that you may have power to certify to Us from time to time your several proceedings in respect of the matters aforesaid, if it may seem expedient for you so to do :

And We do further will and command, and by these Presents ordain, that this Our Commission shall continue in full force and virtue, and that you Our said Commissioners, or any three or more of you, shall and may from time to time proceed in the execution thereof and of every matter and thing therein contained, although the same be not continued from time to time by adjournment :

And for the purpose of aiding you in such matters, We hereby appoint Our trusty and well-beloved Nathaniel Baker, Esquire, Barrister-at-Law, to be Secretary to this Our Commission.

Given at Our Court at St. James's, the Sixteenth day of November one thousand eight hundred and eighty-one, in the Forty-fifth year of Our
Reign.

By Her Majesty's Command.

W. V. HARCOURT.

REPORT.

WE, Your Majesty's Commissioners appointed to enquire respecting small-pox and fever hospitals in the Metropolis, submit to Your Majesty the following Report:—

We have held thirty-seven meetings, at thirty-two of which we have examined forty-eight witnesses, comprising physicians of the highest eminence, the secretary and several medical inspectors of the Local Government Board, managers and officers of the Metropolitan Asylums Board, particularly the medical superintendent of their hospitals, metropolitan health officers, district medical officers, and numerous other persons, from whose experience we expected to derive and have derived assistance. We have also received from proprietors of land in the neighbourhood of small-pox hospitals, and their solicitors, information collected in the conduct of important law-suits. It is the result of these inquiries which we have to lay before Your Majesty.

The questions on which we are called upon to report relate to the prevention and control of epidemic infectious diseases in London and its neighbourhood, and concern mainly the operations of the Metropolitan Asylums Board, constituted under the fifth clause of the Metropolitan Poor Act, 1867.

30 Vict.,
cap. 6.

1. *History of Asylums Hospitals.*

Before the passing of that statute, "The Sanitary Act, 1866," had empowered the sanitary authorities of the metropolis—that is to say, in the City of London the Commissioners of Sewers and, in other metropolitan districts, the vestries or district boards—to take various steps for preventing the spread of infectious disease, and either themselves to establish hospitals, or to agree with the Managers of existing institutions for the reception of their sick.

29 & 30 Vict.
cap. 90.

ss. 22-29.
s. 37.

Among other things it was provided that "any person suffering from any dangerous contagious or infectious disorder, being without proper lodging or accommodation, or lodged in a room occupied by more than one family, or being on board any ship or vessel," might, by order of a justice of the peace, be removed to any hospital within the nuisance district in which he was found, at the expense of the nuisance authority, and with the consent of the superintending body of the hospital.

s. 26.

These provisions extended alike to paupers and non-paupers, but they were merely permissive. They conferred powers, but imposed no duty on the local authorities.

On the other hand, the guardians of the poor in every union were under a legal obligation to provide medical treatment for persons entitled to parish relief, whatever might be the disease by which they were affected.

Lambert, 22.

In this state of the law difficulties and complaints arose. It was alleged that sick paupers were ill looked after, and that the cost of their treatment fell with undue weight on the poorer parishes of London; and it was evident that infectious

Lambert,
9-11.

[NOTE.—The side notes are references to the names of the witnesses and the numbers of the paragraphs containing their evidence attached to the original print of the Report published by the Government.]

diseases—under which term, with a slight sacrifice of exactitude, we include small-pox, scarlet fever, diphtheria, typhus, typhoid, and enteric fever—could not be properly introduced into institutions in which destitute persons were practically forced by law to reside, and in which it would be very difficult and costly to establish such a completely isolated system of administration as would be necessary for their safety.

In view of these defects and difficulties a clause was introduced into the Metropolitan Poor Act of 1867, which empowered the then Poor Law Board, since replaced by the Local Government Board, to combine metropolitan unions or parishes into Asylums Districts, in which hospitals were to be provided for paupers suffering from small-pox or from fever, or being harmless lunatics—the cost of maintenance being charged against the parish from which the patient came, and that of establishment being paid from a general fund.

Under the power thus given the whole metropolis was at once united virtually into one Asylum District; and the Metropolitan Asylums Board, consisting of 15 nominees of the Local Government Board and 45 persons elected by the Metropolitan Boards of Guardians, was created for the purpose of constructing and maintaining the proposed hospitals.

Among their first duties was that of selecting sites. Although it seems to have been generally assumed that well conducted hospitals would not involve any serious danger to their neighbourhood, yet it was evidently hazardous to place them in the centre of dense populations. On the other hand, it was held generally unsafe to move the sick persons more than about three miles. And it followed necessarily from these two principles that the hospitals should be planted, as far as practicable, in a rude circle or ellipse round the metropolis at distances of not many miles from each other.

As might be expected, no neighbourhood was willing to receive them, and the Board, not being armed with any compulsory power of purchase, found great difficulty in acquiring fitting sites. They, however, succeeded in establishing the five hospitals, of which the particulars are shown in the subjoined table.

When Opened.	No. of Patients sanctioned by Local Government Board.			Acreage.		
	Small-pox or Fever.	Small-pox.	Fever.			
Hampstead, 25th Jan., 1870	300	—	—	a.	r.	p.
Homerton, 1st Feb., 1871	—	102	200	8	0	0
Stockwell, 21st Jan., 1871	—	102	198	7	2	0
Fulham, 10th March, 1877	240	—	—	6	1	14
Deptford, 17th March, 1877	310	—	—	9	2	0
	850	204	398			

To these was subsequently added the Hospital Ship "Atlas," fitted for 300 and approved by the Local Government Board for 120 patients, and supplemented by the ship "Endymion" for the residence of the administrative staff.

The Corporation of London, who are the sanitary authority for the port of London, fitted out the ship "Rhin" for the reception of infectious cases occurring on the Thames. But, with this exception, and those of Poplar and Lewisham, the vestries and other sanitary authorities of the metropolis did not adopt the duty of

providing hospital accommodation, to which they were invited by the Sanitary Act of 1866. When the subsequent Act of 1867 was passed, and the Metropolitan Asylums Board appointed, they seem to have held themselves absolved from further responsibility, and down to the present time, with the exceptions above noticed, and subsequently with those of St. Pancras and Islington, to have done little or nothing in the matter. Consequently, when, before any action had been taken by the vestries, London was attacked by the terrible small-pox epidemic of 1871-72, the Board was compelled hurriedly to complete its first hospitals,—those of Hampstead, Homerton, and Stockwell,—and, in the absence of other sanitary provision, to crowd them with persons, who, though unable to provide themselves with that isolated treatment which their own safety and that of the public required, were not in any true sense paupers, and only became so by the act of admission into a pauper institution. Something like nine-tenths of the persons admitted to the asylum hospitals are said to have been of this class.

Lambert, 28.
Lambert, 50.
Lambert, 2884.
Gibb, 2770,
2787.
Lambert, 2888.

Lambert, 28.
Jebb, 194.

It was quite right, or rather under the circumstances inevitable, that this should be done; but it gives the Board the right to point out that they have been forced to undertake duties far more extensive than the legislature contemplated, and it could not but aggravate the complaints—the very natural complaints—which arose in the neighbourhoods in which these now over-filled hospitals had been established.

Jebb, 206.
Currie, 269.

Such complaints had been made from the beginning in Hampstead; and they at last resulted in a lawsuit which may perhaps be considered as still pending. The consequence for the present is that the hospital is closed, and cannot be reopened for small-pox, having been decided by a jury to have been, as hitherto used, a legal nuisance, both in its incidents and in itself—a distinction to which we shall have occasion to refer at length. Another lawsuit has led for the present to the closing of Fulham Hospital, except for cases arising within the distance of a mile. Proceedings which may have a like effect are threatened at Stockwell, and are, of course, possible at Deptford or Homerton.

Few, 111.

Few, 123.

Lambert,
38, 40.

Most disastrous consequences might have followed from the closing of the Hampstead and practically of the Fulham Hospital, but for the energy and resource shown by the Asylums Board in rapidly fitting up a hospital ship on the Thames, and transferring at once some hundreds of small-pox convalescents to their asylum for imbeciles at Darenth. And such consequences might have occurred in spite of these efforts, had the apprehension of a fresh outbreak of small-pox which was entertained in December last been unhappily realised.

Currie, 255.

Tripe, 576.

Whatever the merits of the Asylums Hospitals, they furnish at present our only means of dealing with such epidemics as those of 1871-72, of 1877-78, and of 1881, which cost the metropolis respectively 9,698, 3,968, and 2,371 lives. And if their legal position is to be inferred from recent decisions, it would seem that they merely exist at the sufferance of the neighbourhoods in which they are placed; and under the terrifying influence of an epidemic may be summarily closed, leaving the disease to run its course uncontrolled, and London to take the consequences.

Appendix A,
§ 6.

2. *Objects of Inquiry.*

First among the objects of this inquiry is that of ascertaining how such a calamity as this can be rendered impossible without hardship, or with the least possible hardship, to individuals. And it is necessary to point out emphatically and *in limine* that such a question is not to be treated as one of parochial relief, with primary reference to the case of the indigent sick and an incidental bearing on the

public health, but as one of public safety with primary reference to the general prevention and extirpation of epidemic infectious disease, subject to the obligation of doing all that humanity demands for the benefit of individual sufferers.

Our duty is to examine how this general object can be effected with the greatest public benefit and the least private injury. And we have accordingly not investigated what is not called in question, the treatment of patients in the Asylums Hospitals. That treatment has incidentally been highly praised by some witnesses. It has been impugned by none. And the zeal and intelligence which the managers of the Hospitals have shown in matters which have come under our notice would lead us to believe readily that in this respect their internal administration is substantially unimpeachable.

Nor have we regarded it as our duty to investigate specially the influence on the spread of small-pox in the metropolis of the neglect of vaccination, deeming this to be a matter outside the scope of our inquiry. We think it, however, incumbent on us to state that, in our opinion, the prevalence of the disease in the metropolis of which we have such deplorable evidence is due, far above all other causes, to the neglect of this precaution; that if the practice of vaccination were general and very careful, the liability of the metropolis to serious epidemics of small-pox would cease; and that the more efficient administration of the vaccination laws is the only effectual means by which the recurrence of such epidemics as those of the last 12 years can be prevented or their progress controlled. We deem it, therefore, of the utmost importance that searching inquiry should be made as to the actual state of vaccination in the metropolis and its effect on the prevalence of the disease, and that the results of this inquiry should be made generally known.

With these observations we proceed to the most difficult part of our subject, the provision of hospital accommodation for small-pox patients; and we begin by noticing a few points in what is called the "behaviour" of that disease in England

3. *Behaviour of Small-pox in England.*

The following figures are extracted from a table compiled by Dr. Farr from the "Bills of Mortality" of London,* which purports to show the general and small-pox death rates of London per million in certain selected periods of years previous to the more regular registration which is now established:

Years.	Average annual deaths per million from all Causes.	Average annual deaths per million from Smallpox.
1660-79	80,000	4,170
1728-57	52,000	4,260
1771-80	50,000	5,020
1801-10†	29,200	2,040
1831-35	32,000	830

In 1838 a more complete system of registration was established, and we place in the Appendix a statement by the Registrar General of the absolute annual number of deaths from small-pox from that year to the present time. This statement we here reproduce, with two additional columns, of which one shows the number of deaths per million in each year, and another gives the same information—the number

* See Blue Book, entitled, "Papers relating to the History and Practice of Vaccination," 1857, page 55.

† The date assigned to the discovery of vaccination by Jenner is 1798, and it was some time making its way to general adoption. It was made compulsory in 1853.

Hart, 3760.

Tripe, 582.
Murphy,
3028.
Stevens, 3398,
3490-6.
Bernard,
3337.
Forshall,
3371.
Gull, 4334.

6 & 7 W. 4.
c. 86.

Appendix A.

of deaths per million—on an average of the year against which each figure is set and the four preceeding ones.

Years.	Estimated Population in the Middle of each Year.	Deaths from Smallpox.			Years.	Estimated Population in the Middle of each Year.	Deaths from Smallpox.		
		Annual Total.	Annual Rate per Million of Population.	Rate per Million on Averages of Five Years.			Annual Total.	Annual Rate per Million of Population.	Rate per Million on Averages of Five Years.
1838	1,766,169	3,817	2,161	—	1859	2,725,374	1,158	425	237
1839	1,802,751	634	352	—	1860	2,770,181	898	324	221
1840	1,840,091	1,235	671	—	1861	2,815,101	217	77	195
					1862	2,860,117	366	128	209
1841	1,878,205	1,053	561	—	1863	2,905,210	1,996	687	328
1842	1,917,108	360	188	787					
1843	1,954,041	438	224	399	1864	2,950,361	547	185	280
1844	2,033,816	1,804	887	506	1865	2,995,551	640	214	258
					1866	3,040,761	1,391	457	334
1845	2,073,298	909	438	460					
1846	2,113,535	257	122	372	1867	3,085,971	1,345	436	396
1847	2,202,673	955	434	421	1868	3,131,160	597	191	297
1848	2,244,837	1,620	722	521	1869	3,176,308	275	87	277
					1870	3,221,394	973	302	295
1849	2,287,302	521	228	389	1871	3,267,210	7,912	2,422	688
1850	2,330,054	499	214	344					
1851	2,373,081	1,062	448	409	1872	3,319,528	1,786	538	708
1852	2,416,367	1,159	480	418	1873	3,372,684	113	34	677
					1874	3,426,691	57	17	663
1853	2,459,899	211	86	291	1875	3,481,563	46	13	605
1854	2,503,662	694	277	301	1876	3,537,314	736	208	162
1855	2,547,639	1,039	408	340	1877	3,593,958	2,551	710	196
					1878	3,651,509	1,417	388	267
1856	2,591,815	531	205	291	1879	3,709,981	450	121	288
1857	2,636,174	156	59	207	1880	3,769,390	471	125	310
1858	2,680,700	242	90	208	1881	3,829,751	2,371	619	393

In connection with these tables we first draw attention to the contrast between the alarming death rate from small-pox of 1871, and the death rates of the 17th, the 18th, and the first 10 years of the 19th century. It is reassuring to observe that a mortality of between 2,000 and 3,000 per million, by which we are now rightly startled, must have been 70 or 80 years ago a common experience of the metropolis.

Secondly, it is observable that in the interval between the great epidemics of 1838 and 1871 small-pox appears to have swept over London in broken waves of disease, quadrennial or nearly so, which we have attempted to exhibit by the cross lines which divide the fourth column of the return, marking roughly the periodical culminations of the disease. Tripe, 2192.

Thirdly, we may note that the terrible mortality, as we now think it, of 1871 was not peculiar to London or even to England. The epidemic appears to have arisen in France during the Franco-German war, to have culminated in Paris during the siege,* to have extended with mitigated but still exceptionally destructive power to other parts of the Continent and England, and finally to have passed over the Atlantic to the United States of America.

Fourthly, we point out here, but shall have to notice more fully hereafter, the strangely irregular incidence of the disease, ranging from 2,422 per million in 1871 to 13 in 1875.

* According to Mr. Collin (*La Variole*, Paris, 1875, pp. 58, 109), the deaths from small-pox in Paris during the six months' siege were 1,600 out of 180,000 soldiers and 8,000 out of 1,800,000 civilians. The smaller rate of mortality would be represented in London by 17,000 deaths in the year, the greater by 35,000. The French armies in the field suffered, he says, in like manner with that besieged in the capital. On the other hand, of some hundred German prisoners in Paris only one doubtful case of small-pox was sent to the Bicêtre, the chief hospital for that disease, while the whole small-pox mortality in the whole German army during the whole of the campaign was only 261.

M. Colin ascribes this contrast to the rigid enforcement of re-vaccination in the German army.

Buchanan,
3766-8.

Appendix A.
§ 6.

Buchanan,
3766-8.

Fifthly, we obtain some remarkable results from a comparison between the mortality of London and the provinces. In the latter it appears from tables furnished us by Dr. Buchanan that the rate of small-pox mortality has steadily decreased during the 43 years comprised in the Registrar General's returns; till, in 1879, it might almost be represented as extinct—the mortality sinking to .6 per million—though in 1880-81 it rose again to 1.0 and 2.6. In the metropolis the case was different. We find that from 1871 to 1880 inclusive, the amount of disease in London relatively to the population though less than that in several other great towns, has always been greater than that in England generally, and its rate of diminution has been slower. In London, however, as in the country, till about the year 1860, that diminution was always going on. Then a change took place. While the general provincial mortality continued to decrease, the quinquennial average mortality of London will be seen by the above table to have risen from its minimum of 195 per million in 1861 to 396 in 1867, and to have continued at a somewhat lower but still comparatively high rate till the statistics of metropolitan small-pox were disorganized by the exceptional visitation of 1871 and the reaction, amounting to virtual immunity, of the years 1873, 1874, 1875. During the six following years, 1876-81, the London rate of mortality has gradually risen, on the quinquennial average, to 393. Comparing this average with that of 1861, we seem for the last 21 years to have been grappling with an evil influence which is fitfully but sensibly gaining ground upon us.

Lambert, 92.
Stevens, 3434.

Lastly, it is observable that neither the epidemic of 1871-2, nor the reaction from it, were so violent in the provinces as in London and other large towns. The violence of the epidemic in the large towns is easily accounted for by conditions of life in them—including doubtless the difficulty of enforcing vaccination. The violence of the reaction may in part be easily explained. For of the susceptible persons attacked by small-pox, part are destroyed, and those who are left alive are protected from future attacks of the same disease. Of those who are not attacked, many are frightened into greater carefulness, in the way of vaccination and otherwise, for themselves and those about them. Vigilance also is stimulated among the authorities, as among the population. And thus the infliction carries with it an immunity bearing some proportion to its magnitude, until its moral and physical consequences are worn out; a process which in a moving population like that of London begins soon and proceeds rapidly.

Munk, 4664.

Some of these general observations may be found to be of use in considering what has to be done in stemming the small-pox—a disease which would seem to have been brought under tolerable control in the country—which for 50 years, from 1810 to 1860, appeared to be falling under control in London—but which, as we have said, seems during the last 21 years to be holding or even recovering its ground among us, and which Dr. Munk, the experienced Physician of the Small-pox Hospital at Highgate, believes to be increasing in the severe character of its attacks.

4. *Notification and Isolation of Disease.*

Bristowe, 505.
Thorne, 1029,
1067, 5321.
Dudfield,
1596.

Upon one cardinal point, not exclusively relating to this particular form of infection, the evidence which we have received is almost absolutely unanimous. On the outbreak of an infectious disease the first imperative necessity is to isolate every case immediately and effectually as it arises. On the one hand, such isolation with its incidents almost invariably answers its purpose. We are told with confidence that when in the earliest stage of such a disease the patient is removed to a hospital, the house, its contents, and the adjacent drainage disinfected, and, in the case of

small-pox, the neighbours re-vaccinated, no further apprehension need be felt on the score of that house. When this precaution is neglected the contrary result follows. In one instance 20 cases of small-pox, in another 25, in another 23, in another 16 deaths and 20 cases were distinctly traced to one case of concealment, and the consequent absence of isolation and disinfection. Each freshly infected house tends, neglected, to become a new source of contagion, and the whole to swell into an uncontrollable mass of disease.

We are anxious that the paramount importance of this matter should be early comprehended, and at the risk of appearing rhetorical, we introduce here some of the allegations, general and particular, on which our opinion is based.

"Cases (says Dr. Dudfield, medical officer of health for Kensington) now generally occur singly in houses; we hasten to disinfect, and we expect to hear no more of the disease. If we hear a case pretty quickly, and it is removed, we reckon to have done with that house; we hear no more of the disease there."

Tripe, 576,
2278.

Farr, 1948.

Browning,
4241.

Dudfield,
1596.

The following are the answers given by Dr. Thorne, one of the medical inspectors of the Local Government Board, to questions put to him:—

1028. * * * I should occupy you for hours in telling you of instances in which epidemics have evidently been prevented by the isolation of first cases of infectious disease. Thorne, 1028.

1029. Can you give one typical case to show one particular locality in which that effect was very strikingly produced?—In the Alcester rural district, in Warwickshire, I found that the early removal of cases of scarlet fever from houses which contained children who were unprotected by having had previous attacks had prevented any spread of infection; for example, in three instances the first pupil attacked had been removed from schools, and in each of those cases no spread took place; whereas on another occasion when scarlet fever attacked a pupil at a school, and it was attempted to treat it in isolation in the school building, the disease spread, and seven other attacks followed in the school-house.

1030. I understand you to say that, if it were worth while you could produce a large number of cases contrasting with one another in that way?—Yes, in a similar way.

1031. That is to say, a large number of cases where infection has at once been stopped by removal to hospital, and where the contrary course has led to a spread of the disease?—Yes.

Deputy Surgeon-General Bostock, a manager of the Metropolitan Asylums Board, gives corresponding evidence.

A very remarkable case occurred two or three days ago which will illustrate what I say; six children were admitted upon Saturday night last to the hospital at Stockwell. They all belonged to one family, and lived in a small apartment at the top of the Haymarket; their father is a tailor working for a first-rate firm in the west end of London, and about three weeks ago one of his sons (there were nine in family altogether) had small-pox, which was treated at home and was not notified. These six children all came in on Saturday night; one boy died four hours after admission, two girls died three days afterwards, and three are still left exceedingly ill; the ages of the children being from 15 to 3 years. Now, I think, if the first case that occurred had been notified, all this distress and misery might have been avoided. All the nurses who witnessed their arrival said that they had never seen such a horrible sight; they all came in one ambulance, a most disgraceful proceeding, we thought.

Bostock,
1277-81.

1278. Do you know whether they were vaccinated?—No, they were all unvaccinated.

1279. Do you give it as a specimen case?—Yes, I give it as a specimen case showing the want of compulsory notification.

1280. There are other cases of the same kind?—Yes, plenty.

1281. The father was a tailor, you say?—Yes, in the employ of a fashionable tailor in the west end of London, and in addition to this, underneath was a laundry employing five women, who came every day, where washing was taken in from the neighbouring families. I put it forward as a specimen case of the want of compulsory notification, and the danger that arises from the absence of it.

Collier, 1813.

Mr. Collier, Medical Officer of Health for Fulham, says:—

“No doubt 70 per cent. of the cases that occur, and I say this after the most serious reflection, could be prevented if every case was disclosed. In my reports, published this year, have shown that where cases of small-pox have been immediately reported, and the patient immediately removed, not a single person has caught the disease at the same house, whereas, in houses where the patients have not been removed, other cases have occurred.”

Browning,
4241.

Dr. Browning, Medical Officer of Rotherhithe, speaks to the same effect:—

4241. Do you think that in your district there are many cases of small-pox that ought to be removed which are eventually not removed?—I am sorry to say I think there are a very great many still. I have known one case where I was totally unable to effect a removal from one house, and from that one house 16 deaths occurred and 20 cases of small-pox in all. That was the only case in which I have been really beaten. The medical man in charge refused to co-operate with me. I obtained a magistrate's order for the removal of the worst cases in the house—there were seven in all, three of whom died—to a hospital; it was set at defiance, and there the matter ended for a time till the Local Government Board took the matter up afterwards, because the magistrate declined to do anything further—he knowing of no penalty for refusal of his order; and although I then found out a clause in the Nuisances Removals Act by which I could have summoned the people for nuisance, also a penal clause in the Sanitary Act Amendment Act, 1870, the whole matter was unfortunately obliged to fall to the ground, because I myself was struck down with illness. Here was a case of a well-to-do tradesman, a boot and shoe maker, a hot-headed anti-vaccinationist, who lost his wife and three children in succession by the most aggravated form of small-pox, who persisted in refusing to allow the others in the house to be re-vaccinated, and refused to allow them to be sent to hospital—he still keeping his shop open and spreading the disease amongst his neighbours. After the death of one of his children he borrowed a suit of black clothes from a neighbour, which was sent back to the owner, and he put it on and took smallpox and died within a fortnight.

To prevent all this is indispensable, even at some cost of individual liberty and convenience. We shall perhaps best perform our duty by stating what sacrifices of this kind appear to us to be required for the general protection, leaving it for Parliament to consider whether they are such as the community may properly be called upon to make in its own interests and to what limitations they should be subject.

Hastings,
5092.
Thorne, 1063,
1143.
Hart, 3719-28.

In the provinces many large towns have been empowered by Local Acts of Parliament to make the prompt notification of infectious disease compulsory and its neglect penal. And this power has been exercised apparently without serious complaint and with good effect.

Thorne, 1141,
29 & 30 Vict.
c. 90.
14 & 15 Vict.
c. 28.
16 & 17 Vict.
c. 41.
Appendix E.
Tripe, 2270-5.
Bristowe,
557, 572.
Dudfield,
1467, 1560,
1562.

But in London the only provisions of this kind relate to lodging-houses, and have not been acted upon. It appears to us that such notification should in all cases whatever be obligatory on one or more of the following persons—the patient—those in charge of him—the occupier of the house in which he lodges—his medical attendant, or any relieving officer to whom, if a pauper, he may apply for assistance. In effect it is only by the medical attendant, if any, that the disease can be intelligently notified, since it is only he who can be presumed to know what it is, and who has no interest in concealing it. But it is represented that to impose this duty upon him directly and unreservedly would interfere with the relations which ought to exist between him and his patient, and might prevent the aid of a medical attendant being sought for at all. If this be so, it may be sufficient that the medical attendant should be required by law to furnish the persons in charge of a patient or the owner or occupier of the house in which he lodges, with a certificate of the nature of the disease, stating whether proper isolation can or cannot in his opinion be secured without removal, and, when removal is necessary, stating also to what extent the case is urgent or severe. Every fresh case which occurs, even in the same house, should be the subject of a fresh certificate. The persons to whom this

certificate is given should be in like manner required by law to forward it at once through the medical officer of health to the hospital authority (to be distinguished from the guardians of poor law authority on the one hand, and the vestries or sanitary authority on the other), with whom it would rest to see that the sick person, if not properly isolated, is at once removed. The medical attendant should, we think, in justice be entitled to claim a fee, either from the patient or from the sanitary authority, for every such certificate of his which reaches the medical officer.

Tripe, 2271.
Hart, 3724.

If the sick person is not under medical treatment the notification should be made by the persons in charge of him to the medical officer of health as soon as there is reason to suspect the nature of his illness.

In all this we suggest no distinction between rich and poor, pauper and non-pauper cases, except that between persons who can and persons who cannot be isolated at their homes or in some place approved by the proper authorities—an exception which, of course, will not extend to the official notification of disease. In default of such isolation the hospital authority (however constituted) should, we conceive, be bound and empowered to remove to the hospital any patient capable of removal without risk to life or serious aggravation of the disease.

Appendix E.

This removal can at present only be enforced either indirectly, in the case of paupers, by the refusal of parish relief on any other condition, or directly by order of a magistrate, under the conditions prescribed by The Sanitary Act, 1866, which, we are told, have been construed not to authorise removal whenever required for the public safety, but only if required for the benefit of the patient, and that only to a hospital within the nuisance or sanitary district in which he is living.

Lambert, 19.

Collier, 1773.

All these limitations should, we conceive, be abolished, and any person suffering from infectious disease whose removal becomes necessary, either for his own benefit or for the public safety, should be legally removable to any hospital under the jurisdiction of the hospital authority and appropriate to his complaint.

We do not overlook the real difficulty to be encountered in any rigorous enforcement of such statutory powers. The separation of one or more members of a family from the rest for several weeks—a mother from her children, a husband from his wife—inflicts a grievous trial, and in many cases an almost intolerable hardship. And this hardship must fall for the most part upon the poorer classes, because all above these may find means, though often at a great sacrifice, of securing the necessary isolation at home, and so escaping the trying alternative of separation. But nothing short of this can possibly effect the end in view. Without the power of removal, the compulsory notification of disease would be of comparatively little avail.

When the patient is not capable of removal without risk, the sanitary authority should have power to clear the house of its other inmates, so far as is necessary for the purpose of isolation—taking charge of the patient—adopting all necessary steps of disinfection—re-vaccinating, if possible, in the case of small-pox, all who are otherwise insufficiently protected from the disease, and compensating those whom it is necessary to disturb. The object being the immediate protection of the public, the expense of all this, which can hardly fail to be well bestowed, must necessarily be borne, in the first instance, by the public. But expenses incurred for the benefit of the patient might properly be recovered, if practicable, from him.

Tripe, 2250

5. Distinction of Pauperism to be abolished ; paying and non-paying Patients.

It is evidently of paramount importance that the hospitals to which so many classes of persons will become liable to be removed should be made as little unattractive as the nature of the case admits.

Bridges, 752.

Thorne,
1107-17.
De Chau-
ment, 2463.
Chalmers,
3897-9, 3963.
Appendix E.
Appendix F.

The pauper character which now attaches to the hospitals of the Asylums Board, and renders them repulsive to all but the indigent, would disappear if the distinction between paupers and non-paupers were abolished. But the consequent mixture of different classes would entail inconvenience of an opposite kind. It is plain that the language and habits of some kinds of inmates could not fail to be painful and mischievous to others, and most especially to respectable young women and to children. This hardship, which we understand is severely felt in some general hospitals, should be as far as possible mitigated, first by the exercise of all practicable judgment in the classification of patients, and next by allotting a separate ward or wards to those who are willing to pay for comparative privacy. It is for the consideration of the hospital authorities how far their regulations could make allowance for any peculiar prejudices entertained by particular classes of persons against ordinary measures or modes of treatment.

Thorne, 1113.

As in the case of clearing infected houses, the expense of all these operations must be borne in the first instance by the public. It is a question, except in the case of separate wards, whether it should be ultimately recoverable even from those who are able to pay for it.

In favour of that recovery is the obvious argument that those who receive what is assumed to be a benefit should pay for it if they can.

Gibb, 2761-4,
2800.

On the other hand, the following considerations are not without weight. The person who is thus required to pay for his hospital treatment may have been compelled without any choice of his own or of those in charge of him, perhaps even against his or their will, to submit to it. The sanitary authorities will find much difficulty in drawing the line between those who can and those who cannot be fairly expected to pay. It has, in point of fact, been found almost impossible to exact payment even in cases where it was plainly due. It is desirable, in the public interest, to attract to these hospitals, even by the bribe of gratuitous treatment, all who will go thither. A payment made by one class for accommodation which is afforded without payment to another appears to place the latter on the footing of paupers, which it is desirable to avoid. And it is not to be wholly forgotten that the well-to-do persons on whom alone the claim can be made are probably ratepayers, who have contributed more to the maintenance of the hospital than those who will have been treated gratuitously. In case of legislation these opposite considerations will doubtless receive the attention of Parliament.

6. *Hospital authorities.*

Hill, 1634.
Lamb, 2901,
2914.
Gull, 4323-5,
4435.

Bridges, 662.
Dudfield,
1470.
Tripe, 2199.
Gibb, 2765.

Stevens,
3389, 3424-6,
3446.

Simon, 4566.
Appendix E.
Appendix F.

We have spoken of the hospital authority, but have not indicated what that authority should be. It has been suggested that the metropolitan parishes or groups of them should manage each their own sick, and it has been argued that this division of responsibility would stimulate invention and emulation, and thus lead to an improvement more rapid than could be expected from a single authority. We doubt whether this conclusion is warranted either by the reasons alleged or by the experience of parochial government. And we perceive that the opinion of those who have been engaged in the management of infectious diseases is almost unanimous in favour of a central authority for the Metropolis.

Such an authority, in proportion as it acts over a larger area, acts also under a stronger light, and under a wider and more effective responsibility to a larger and more intelligent public opinion. Placed under such a responsibility it certainly may, and probably will be trusted with greater powers for doing at once and effectually what is

right. It will bring to a focus, and will be able to give instant and extended effect, to all the experience which will otherwise be scattered, with various results, among a variety of bodies not always actuated by broad or accurate views. It will be able to make the different parts of a large system work into each other, not only for the advancement of practical efficiency, but also for the careful observation, collection, and publication of facts systematically observed over the large field which their operations will cover. Finally, it will probably be able, from its dignity and importance, to command a higher class of administrators. The Board, if it is one, will be the picked men of the metropolis, instead of the picked men of a parish.

Add to this, first, that the metropolitan guardians have not desired, and the vestries, as a whole, have declined the responsibility which it is proposed to cast on them, and would therefore be unwilling agents, and next that many of the recommendations which we shall presently make absolutely require to be carried into effect under a single management.

On all these grounds we have no doubt that the governing authority should be a single one.

And its necessary duties, if they are what we have described them, make it equally clear that it should be, in its general aspect, not a pauper but a sanitary authority. In its general aspect we say, because no doubt its functions will largely have relation to the indigent classes; and it is therefore just and advisable that the boards of guardians should continue to exercise an influence in its composition conjointly with the vestries.

We must add, however, that with these views of the constitution of the hospital authority we should greatly regret any radical change in its personal composition. The gentlemen who now act on the Metropolitan Asylums Board must have accumulated great knowledge, and they have shown a remarkable amount of self-devotion, intelligence, and zeal. And though our enlarging experience of the behaviour of small-pox and other infectious fevers may have shown that they with many other eminent persons were led by imperfect data to imperfect conclusions, we do not believe that the public is likely to secure the services of a more efficient body of administrators.

Any recommendations on this head may be affected by the changes which appear likely to be made in the municipal constitution of the metropolis. Subject to such changes, it seems advisable that the members of the Board should be in part nominated as at present by the proper department of Government, and in part elected by sanitary authorities and boards of guardians. Those who have special knowledge of metropolitan administration will be best able to say how these authorities may be most conveniently combined. In default of a better plan, there could be no difficulty we imagine in providing that London should be divided for this purpose into groups of parishes, and the members of the Board for each group chosen part by the united vestries and part by the united boards of guardians.

Of the exact functions of the Board we shall have to speak as we proceed. Meantime, we may here draw attention to three questions arising on the evidence which we have received—first, whether the medical superintendence of each of these hospitals should not be placed under the supervision of some physician of high character, nominated by the Asylums Board; next, whether these large institutions might be safely made available for clinical instruction to students in medicine; and, lastly, whether the general superintendence of vaccination should not be transferred, with that of the hospitals, from the Poor Law to the Sanitary Authorities. Our own opinion is distinctly in favour of such a transfer.

Galsworthy,
3590.
Appendix I.

Bridges, 748,
750.
Buchanan,
3853.
Gibb, 2817.
Appendix F.

Tripe, 578.
Hart, 3760.

Galsworthy,
3565.

Tripe, 2194.
Gibb, 2778.
Hart, 3715.
Currie, 5545.
Appendix E.
Appendix F.

Gull, 4420.
Bennett,
4926-7.

7. *Amount of Hospital accommodation required for Small-pox.*

We now come to the question what hospitals are required for the treatment of infectious disease, and where? And, first, what is the amount of accommodation likely to be required for small-pox patients?

Appendix A.,
section 6.
Appendix D.
Appendix H.

The authentic materials for answering this question are contained partly in the mortality returns of the Registrar General already quoted, and partly in the records of the Asylums Hospitals.

The former of these are complete as far as they go, but they are only concerned with mortality, and give no information as to the prevalence of disease except so far as its comparative prevalence at different times and places may be inferred from the comparative number of deaths.

The latter extend to cases of sickness received in the hospitals, as well as to the deaths occurring there. But they are confined to these cases, and give no information respecting sickness which is treated at home, except on the more than uncertain assumption that the proportion of cases to deaths is the same outside the hospital as in it. It is only by piecing together information derived from these sources that any estimate can be made of the maximum number of patients which the London hospitals should be prepared to receive on such notice as an epidemic gives of its approach.

We have already observed that the amount of metropolitan mortality from small-pox is strangely irregular—ranging from 2,422 per million in 1871 to 13 in 1875. But it is necessary further to analyse this irregularity.

Twice, and only twice, in the 43 years to which the Registrar's return extends, and at an interval of 33 years, the proportion of deaths per million has exceeded 2,000.

In the remaining 41 years it only once approached 900, and ranged—
 in 3 years from 700 to 900,
 in 17 years from 250 to 700,
 in 13 years from 100 to 250,
 and in 8 years it was under 100.

The population of London will soon be 4,000,000, and if we assume for the moment that the past is our best measure of the future, it would seem that we have to expect once in about 30 years an absolute mortality varying from 8,000 to 10,000 deaths, and apart from these extraordinary outbursts, that the sickness of the remaining 41 years will be indicated by a mortality ranging—

 in 3 years from 2,800 to 3,600,
 in 17 ,, 1,000 to 2,800,
 in 13 ,, 400 to 1,000, and
 in 8 being under 400.

—
41
—

The mere inspection of these figures seems to indicate, first, that our hospital arrangements should be of an extremely elastic kind, capable of large and rapid expansion and contraction; secondly, that for the purpose of determining our normal state of preparation the two exceptional visitations of 1838 and 1871 may be neglected; and thirdly, that the three years in which the mortality may be supposed to range from 2,800 to 3,600 should dictate our ordinary state of readiness.

To this we add that if our suggestions respecting the notification of disease are accepted and produce their effect, we may expect on the one hand that about

three quarters of the small-pox cases will find their way to the hospital, and three quarters of the deaths will occur there; and we may hope on the other that, by thus bringing under public control all cases incapable of isolation at home and securing certified isolation for others, both the average and the maximum number of cases and amount of mortality will be greatly diminished. Taking into account this increased influx, but not the diminution which may be expected from it, we infer that we shall be more than safe in basing our preparations on a hospital mortality ranging from (three quarters of 2,800) 2,100 to (three quarters of 3,600) 2,700 per annum.

It follows to inquire what is the maximum strain on the hospital which is likely to be caused by the sickness of which this mortality is the exponent?

The subjoined tables are compiled from returns which have been placed before us. The first records the experience of three epidemics, and is valuable showing at least in the two later epidemics, the increasing popularity of the hospitals. In the first epidemic the deaths at home are twice as many as those in hospital; in the second their number is scarcely greater; in the third they are only three to five.

Date.	Deaths from Smallpox during Epidemic.		
	In Hospital.	At Home.	Total.
1871-2	3,020	6,623	9,643
1877-8	2,028	1,932	3,960
1881	1,431	942	2,373

Appendix D.

The second table relates not to epidemic periods but to years of greatest mortality. In 1871 the hospital accommodation was not equal to the demand on it, and, therefore, the figure, 2,206, in the fourth column, shows not the demand on the hospitals, but their capacity. But the two other figures in the same column, 1,146 and 1,431, show the real strain on the hospital and give reason to expect that in such years the maximum number of cases under treatment there at any one time will not, in these periods of trial, much exceed the number of deaths which occur there during the 12 months.

Year.	Maximum* Smallpox cases under Treatment.	Date of Maximum.	Deaths in Hospital.
1871	2,027	May 27, 1871	2,206
1877	980	April 7, 1877	1,146
1881	1,680	June 11, 1881	1,431

On this supposition the maximum strain in years of greatest mortality would range about from 2,100 to 2,700.

And we observe that the smaller number of 2,100 is not very far from the anticipations of those who appear to have considered the matter with moderation.

The extreme variability of the strain on the hospitals, coupled with this indication of its maximum, would lead to something like the following recommendations:—

First, that the two great exceptional visitations should be neglected, unless it

Bridges, 762.
Bostock, 1365.
Tripe, 2170,
2171, 2178.
Dudfield,
1422.

* In these figures, which are deduced from the last table in Appendix D, allowance is made for the deaths from fever.

be deemed right that the hospital authority should hold in reserve some power of purchasing land and making sanitary regulations in extraordinary emergencies—only to be exercised with the sanction of the Local Government Board or Privy Council.

Next, that the hospital authority should acquire sites sufficient, with what they already possess, for the accommodation of 2,700 small-pox patients. If hospitals be established on the river, the extent of the sites to be acquired on land will of course be proportionally reduced.

Thirdly, that administrative blocks, for the officers and offices of the establishments, should be constructed on these sites sufficient to house the necessary staff and supply the necessary appliances for 2,100 patients; and

Fourthly, that permanent wards for a small number of patients should be attached to each of these administrative blocks, with the requisite facilities for constructing cheap and temporary wards when an emergency arises, to be carefully disinfected if not destroyed when the emergency has passed.

The number for which hospitals are to be prepared being thus fixed at 2,100 the next question is where these establishments should be placed.

8. *Location of Hospitals.*

Starting from this number of small-pox cases, it seems to be expected that under a stringent system of immediate notification, three fourths of the whole number that come to light will be recognised as of such a character that they may be sent safely seven or eight miles or more into the country. This would remove far from London, and from the opportunities of spreading infection, a very large proportion of the cases, and would at once reduce the number to be treated in London to 500 or 600. But this is not all. For it is universally agreed that even those who cannot be moved far during the acute stage of their disease, should be sent into the country as soon as they are convalescent. This involves a further reduction. The average period of convalescence is said to be about equal to that of acute illness. And on this calculation the London cases would be further reduced by one half. But this is more than can be expected. For, in the first place, if the mild cases are removed into the country those retained in London will be the most severe, and the convalescence longer deferred. And next, it must be remembered that a metropolitan epidemic does not fall simultaneously and with equal force upon the whole of London but travels from neighbourhood to neighbourhood. The pressure, therefore, is local and as London cases must from their very severity be sent to the nearest hospital, the hospitals cannot supplement each other, and each must therefore be prepared to take as the disease reaches its neighbourhood, somewhat more than a rateable share of metropolitan sickness. For it is most important to avoid, as far as possible, the injustice of transferring, in any case, the disease of one populous district to another.

Deducting then, on the one hand, from the total strain on the metropolitan hospitals (1) those who are too ill to be removed from their own homes; (2) those who are capable of being removed at once seven or eight miles into the country and (3) those by convalescence who have become capable of removal; but, on the other hand, enlarging our numbers on account of the considerations which we have just mentioned, it appears to us, that accommodation need not be furnished within easy reach of the spots in which the patients are taken ill for more than 400 or 500 persons at a time, and this only for short periods, and at intervals of several years.

If the metropolitan sites now in possession of the Asylums Board could

Munk, 4649,
4651.
Gayton, 2623.
Currie, 5435.

Bostock, 1301.
Collie, 2152.
Appendix E.
Appendix F.

Currie, 5434.

legally and without injustice be applied to the purposes for which they were required, they would be much more than sufficient for the treatment of this greatly reduced number of Smallpox cases.

But it is alleged that the existing hospitals of the Metropolitan Asylums Board spread disease through their neighbourhoods, and cannot therefore be so applied. And this opinion has, in two cases, been adopted by a jury or a court of law, though in one of them it has not been re-affirmed by the House of Lords. We have anxiously considered to what extent it is true, and whether the same consequence would ensue if the number of cases received into these hospitals were greatly reduced.

But first we desire to observe that in facing the difficulties imposed on them by the recent epidemic—difficulties incalculably heightened by the results of the Hampstead and Fulham lawsuits—the managers of the Asylums Board appear to have evinced the same zeal, self-devotion, and resource which drew forth the high eulogium passed on their services by the Parliamentary Committee of 1875. And we add that, if in one respect we are obliged to qualify the conclusions arrived at by that Committee, it is not that we judge these conclusions unwarranted by the evidence then obtainable, but that, since that time, a mass of experience, unprecedented in the history of the disease, has been accumulating, that this experience has been subjected to an unusually severe and methodical scrutiny, and that, as a consequence of this scrutiny, new views have been opened out and opinions which were almost universally received in this and other countries are seriously called in question.

9. Hospitals whether Centres of Infection.

With this preface we address ourselves to the questions whether the establishment of Asylums Hospitals has in fact caused an increased prevalence of small-pox in their respective neighbourhoods; whether, if so, this increased prevalence is due to the incidents of the hospital—the incomings and outgoings of persons and things—which may be conveniently summed up in the phrase “personal communication;” or to some atmospheric or other immediate diffusion of the disease from the establishment itself, independently of that communication; or to both of these influences at once; and finally by what arrangements, if any, these evil effects, if they exist, can be averted or minimised.

That by some means or other the Asylums Hospitals in their present shape cause an increase of small-pox in their neighbourhoods appears to us clearly established by the experience of these five hospitals during the last ten years.

No weight at all is to be ascribed to the mere unexamined fact that the establishment of a particular hospital was followed by a prevalence of small-pox in its neighbourhood. For it may have been, and was likely to be the case that the hospital was established at a time when small-pox was spreading over London, or approaching the particular locality in which it was placed. What is more to the purpose is to inquire whether upon each opening or closing of a hospital the mortality in its neighbourhood at once increased or decreased in comparison with that of the other metropolitan districts.

We place in the Appendix tables furnished by Mr. Bostock, one of the nominated managers of the Metropolitan Asylums Board, which show the relative mortality of all the London unions or parishes—first, on an average of the ten years from 1861 to 1870—and then during each of the epidemics of 1871-2, of 1877-8, Appendix D.

and of 1880-1. Up to the year 1870 there were 29 such unions or parishes (Fulham not being yet separate from Kensington), in subsequent years 30; and they are in each table numbered in the order of their healthiness. The result, as regards the parishes most affected by the neighbourhood of hospitals, is shown in the annexed table; in which the figures indicate the place of each in the scale of healthiness. The years during which the respective hospitals were open are coloured, those during which the hospital was partially closed being partially so.

On a study of this table it will be seen that, with two unimportant exceptions (Lambeth, 1880 and 1881, St. Pancras, 1880), it shows throughout a comparative increase or decrease of the parochial mortality concurrently with the opening or closing of the hospitals.

The *primâ facie* presumption resulting from this concurrence would be completely disposed of if it were shown that this mortality, or the sickness from which it arose, occurred in all or most cases at a distance from the hospitals. On the other hand it would be converted into something like certainty, if this mortality or sickness were found in all or most cases, to cluster itself round the hospital. And as regards sickness this appears to be the case. The character and value of the evidence which we have received differs in the cases of different hospital districts. But, except with regard to Greenwich, of which we shall speak in its turn, it is uniform in its direction.

We take first the salient points of the evidence in respect to those hospitals where the investigation has been most complete, those at Hampstead and Fulham. The case of Hampstead was examined, naturally with an adverse bias, but very laboriously, by Mr. Pearson Hill, a gentleman interested in the adjoining property but from his official position practised in the handling of statistics. He presents us with two tables relating to the two epidemics of 1870-2 and 1876-8.

It is not alleged that, before the establishment of the hospital on its present site, there was any special prevalence of small-pox there relatively to the rest of the parish. Indeed the hospital sites are stated generally (as might have been expected) to have been chosen with regard to salubrity. But it appears from these tables that in the epidemical periods 1870-2 and 1876-8 the comparative number of cases sent into hospital per 1,000 of population was :—

	1870-2.	1876-8.
From certain streets in the neighbourhood of the hospital	22·3	25·9
From a 300 yards belt round the hospital site	15·7	17·6
From a circle of the same extent round the workhouse	3·1	2·2
From the rest of the parish	4·3	1·3

It is evident that the increased rate of mortality in the parish generally was due to a specially increased number of cases round the hospital.

The case of Fulham was examined at the direction of the Local Government Board by one of its inspectors, Mr. Power, whose conclusions are embodied in a remarkable report, of which a *résumé* was given before us in evidence. Mr. Power's prepossessions were, if anything, adverse to the conclusions at which he arrived, and his report evinces the most careful industry in the collection of facts. His method is different from that of Mr. Hill, and for the purpose of our present question more searching. His object being to inquire into the spread of infection from the hospital, the cases of those who, being in one house, probably derived the disease from each other, became irrelevant, and these he eliminates, by directing his inquiry,

RELATIVE POSITION OF THE UNDERMENTIONED PARISHES
IN THE SCALE OF MORTALITY FROM SMALLPOX OF ALL
THE PARISHES IN THE ASYLUMS DISTRICT ARRANGED
IN ORDER OF GREATEST HEALTH.

<i>Parish.</i>	<i>Name of Hospital in, or adjoining the Parish.</i>	<i>1861-70.</i>	<i>1871-72.</i>	<i>1877-78.</i>	<i>1880.</i>	<i>1881.</i>
<i>Hampstead</i>	<i>Hampstead</i>	<i>1</i>	<i>8</i>	<i>14</i>	<i>2</i>	<i>1</i>
<i>St. Pancras</i>		<i>9</i>	<i>24</i>	<i>13</i>	<i>16</i>	<i>9</i>
<i>Lambeth</i>	<i>Stockwell</i>	<i>14</i>	<i>21</i>	<i>21</i>	<i>10</i>	<i>14</i>
<i>Hackney</i>	<i>Homerton</i>	<i>6</i>	<i>26</i>	<i>28</i>	<i>28</i>	<i>28</i>
<i>Camberwell</i>	<i>Deptford</i>	<i>8</i>	<i>16</i>	<i>25</i>	<i>24</i>	<i>27</i>
<i>Greenwich</i>		<i>17</i>	<i>5</i>	<i>19</i>	<i>23</i>	<i>30</i>
<i>Fulham</i>	<i>Fulham</i>		<i>6</i>	<i>20</i>	<i>20</i>	<i>13</i>
<i>Kensington</i>		<i>5</i>	<i>7</i>	<i>11</i>	<i>15</i>	<i>10</i>

Years during which the hospitals were open shaded Red.

NOTE.—5 Sept., 1881, Injunction limiting cases to Fulham Hospital to 1 Mile radius.



not to the number of patients sent to the hospital, but to the number of houses infected in the areas which he compares.

Proceeding on this basis, he draws round the hospital four circles, having for their radii, respectively, a quarter of a mile, half a mile, three quarters of a mile, and a mile. The whole area included in the largest circle he calls the special area. Then he divides the period during which Fulham Hospital was open into five epidemical periods; and he examines in respect of each period the proportion of houses infected respectively in the central circle, and in each of the quarter-mile belts which surround it. The result is that in every separate epidemical period he finds the disease diffused round the hospital in circles of decreasing intensity. This graduated incidence of disease is shown by the subjoined table, in which, as elsewhere in this report, the term "acute" is intended to include all cases, whether mild or severe, that are not yet convalescent.

Power, 896.

TABLE VI.—SHOWING ADMISSIONS of ACUTE SMALLPOX to Fulham Hospital, and INCIDENCE of SMALLPOX upon HOUSES in SEVERAL DIVISIONS of the Special Area (of a mile radius from the Hospital) during Five Epidemic Periods.

Cases of Acute Smallpox Admitted.	In Epidemic Periods since Opening of Hospital.	Incidence on every 100 Houses within the Special Area and its Divisions.				
		On Total Special Area.	On Small Circle, $\frac{1}{4}$ Mile.	On First Ring, $\frac{1}{4}$ – $\frac{1}{2}$ Mile.	On Second Ring, $\frac{1}{2}$ – $\frac{3}{4}$ Mile.	On Third Ring, $\frac{3}{4}$ –1 Mile.
327	March, 1877, to end of 1877	1·10	3·47	1·37	1·27	·36
714	January, 1878, to September, 1878... ..	1·80	4·62	2·55	1·84	·67
679	September, 1878, to October, 1879... ..	1·68	4·40	2·63	1·49	·64
292	October, 1879, to December, 1880	·58	1·85	1·06	·30	·28
515	December, 1880, to 2nd April 1881... ..	1·21	3·00	1·64	1·25	·61
2,527	Five periods	6·37	17·35	9·25	6·16	2·57

In Fulham, therefore, as in Hampstead, the mortality which depressed the parish in the metropolitan scale of health is shown to be accompanied by a special increase of disease in the neighbourhood of the hospital.

Round the Homerton Hospital the investigation though elaborate has not been so minutely systematised; but the facts are similar. Dr. Tripe, the medical officer of Hackney, who in pursuance of his duties has examined, with great fulness, the statistics of small-pox in his parish, informs us that the small-pox cases per 1,000 of the population were during the years 1871, 1876, and 1880 as follows :—

Tripe, 579.

	1871.	1876.	1880.
In streets adjacent to the hospital	73	35	15
Within a quarter of a mile radius	48	23	12
Amongst other streets of the same low class, with a } population of about 30,000	21	11	10

The sickness round the hospital in 1871 and 1876 was thus more than three times as great, and that in 1880-1 half as great again, as that in houses of the same class elsewhere. And this falls in fairly with a statement made by Dr. Bridges, the inspector of the Local Government Board, who, not distinguishing between one class

Appendix L.
Bridges, 591,
592.

of house and another, states that the number of infected houses within a quarter of a mile of the hospital was four or five times what it was elsewhere.

The evidence respecting Deptford Hospital, which is situate on the confine of Greenwich and Camberwell, and that at Stockwell in Lambeth, are less detailed. Dr. Bristowe, the medical officer of Camberwell, produced maps in which he pointed out that small-pox cases, which were previously scattered through that parish showed, after the establishment of the Deptford Hospital, a tendency to group round it; and he appended to his evidence four tables of death rates from small-pox, from which it may be collected that, in that part of Peckham which adjoins the hospital (known as No. 4 ward) this death rate, while the hospital was at work, increased relatively to the rest of the parish. The hospital was first opened on the 17th March 1877, was closed on the 31st of August of that year, was opened again on the 11th April, 1878, and remained open to the end of the period to which the returns relate. During these periods the following were the death rates from small-pox per 100,000 inhabitants in the parish of Camberwell :—

	Hospital Closed.		Hospital Opened.	
	Parish.	Fourth Ward.	Parish.	Fourth Ward.
From 1st January, 1876, to 28th February, 1877...	48·5	69·5	...	...
„ 1st March, 1877, to 31st August, 1877 ...	...	...	45·5	120·0
„ 1st September, 1877, to 1st April, 1878 ...	25·0	45·0	...	...
„ 1st September, 1878, to 31st December, 1881 ...	...	...	202·5	454·5

The mortality in the ward No. 4 it will be seen was at all times greater than it was elsewhere. But the excess increases while the hospital is at work. While the hospital is closed that excess in the fourth ward is about that of seven over five, but while the hospital is open it is in the proportion of more than two to one. The fact by itself would be of little value. But it agrees with those already cited and connecting the increase of mortality showing to have occurred in Camberwell with that part of the parish which adjoins the hospital, comes in aid of Dr. Bristowe's general expression of opinion "that the hospital is a very decided source of danger to the neighbourhood, and increases the incidence of small-pox very largely in the neighbourhood."

With regard to Stockwell we have not the same display of figures, but we have again the opinion of Mr. Bostock, who, besides being (as we have said) manager of the Metropolitan Asylums Board, is chairman of the Stockwell and Fulham Hospital Committees, and that of Mr. Archer Farr, late medical officer of Lambeth. Mr. Bostock's opinion is expressed as follows :—

"I would draw attention to what has happened at Stockwell, which is even more important than the case of Fulham, because the houses at Stockwell come within 30 yards of the hospital. When we first opened the hospitals on the site at Stockwell, which is about six acres, we had 62 cases of small-pox pressed upon us by the severity of the epidemic of 1871-2; and it was, I think, followed by a spread of cases round about the hospitals. The same thing happened in a minor degree in 1877, when only one hospital was filled with small-pox, but much over-crowded. The small-pox hospital at Stockwell was licensed to contain 102 beds, and the Local Government Board gave permission to put 120 cases into it. In 1877 we had an average of 157 cases in the hospital which was one-third more than we ought to have taken. This, I think, was followed by a spread of disease in the neighbourhood.

"Have you any statistics upon that point?—Your maps will show you, but I have not the least doubt of the fact that hospitals containing 600 patients, as at Hampstead and Stockwell, do spread the disease in the quarter-mile and half-mile radius."

And this receives a partial, but important, because unconscious, corroboration from the evidence of Mr. Bernard, the medical superintendent of Stockwell Hospital, respecting the epidemic of 1880-81. He states that for 400 yards round the hospital the population is pretty evenly spread, the sanitary condition being homogeneous and "simply abominable." Dividing the area by concentric circles at distances of 100 yards, and neglecting the central circle (probably because it contains little more than the hospital) Mr. Bernard informs us of the number of cases admitted to the hospital from each of the concentric rings between 21st February, 1880, and August 1st, 1881. A simple calculation will show that the areas of Mr. Bernard's rings are in the proportion of 3, 5, and 7. The numbers admitted from each are 30, 21, and 33. The subjoined table shows the result.

Bernard,
3186, 3191,
3301.

		Proportion of Areas.	Cases arising in each Area.	Proportion of Cases to Area.
Between 100 and 200 yards	...	3	30	$\frac{30}{3} = 10$
Between 200 and 300 yards	...	5	21	$\frac{21}{5} = 4.2$
Between 300 and 400 yards	...	7	33	$\frac{33}{7} = 4.71$

The sickness during these 17 months appears to have been intensified within 400 yards of the hospital but (as far as these returns show) not sensibly beyond that limit.

Beyond 400 yards the population, according to Mr. Bernard, changes its character so completely that no comparison can be made between the two areas.

In St. Pancras we have no evidence to show either that the mortality is, or that it is not, connected with the Hampstead hospital.

In Greenwich it is plainly unconnected with that at Deptford. It occurred mainly in a different part of the parish, and is explained by the medical officer, Mr. Pink, in a way which is instructive on special grounds. First he says with regard to the neighbourhood of the hospital—

The greater number of cases of small-pox certainly have occurred a long distance from the hospital. I have no doubt the very immediate district, Hatcham, has had its share of the number of cases that have occurred generally throughout the district taking the proportion of the population, but certainly not an excess of its share.

Pink, 5290.

5291. Not more than elsewhere?—Indeed, not so much as other parts of the district in proportion to the population.

5296. Your opinion upon the whole is that the hospital has been an advantage to Greenwich district, and not a disadvantage?—Decidedly.

And this is his account of what occurred elsewhere :—

"In the year 1881, in the month of March or April, the hospital became so full that cases could not be taken in, excepting in their turn. The hospital was so full that I had in about the course of three weeks or a month, speaking in round numbers, about 160 cases in my district treated at their own homes, and I found that as soon as these cases were compelled to be treated at their own homes, the disease spread with much greater violence. I found that the cases doubled in the months of May and June to what they had been previously, and then upon the Asylums authorities opening the convalescent hospital at Dartford, the convalescents being taken there, and making room for the entrance of fresh cases into hospital, I immediately emptied, if I may use the phrase, the whole of my district of all the cases then existing, and I think I am right in stating that I sent about 163 cases into hospital in about three weeks from my own district, fairly filling the hospital again; and, immediately after I was enabled to do that, I found a considerable diminution in the number of cases arising."

Pink, 5306.

5307. You mean new cases?—Yes, there was a sensible diminution which has been going gradually on up to the present time.

According to this officer the hospital at Deptford greatly reduced sickness Greenwich, without apparently increasing it at Hatcham.

It may be possible, or even in most cases easy, to point out conceivable actual reasons, independently of any of the hospitals, for the prevalence of small-pox in its neighbourhood at this or that particular period. The character of the population, the building and occupation of new houses, and the state of the sewers, have been urged upon us on this point of view. In particular cases a comparatively large number of cases credited roughly to a hospital may be shown in point of fact to have originated elsewhere. And it cannot be denied that the merest accident in a careless and neglected neighbourhood may have had consequences which, when numbers are small, produce a wholly disproportionate effect on an average or percentage. But isolated and partial explanations of this kind, which it would be an endless task to examine, seem to us overborne by the broad stream of concurrent evidence which the last ten years have accumulated; and we cannot but conclude that the increase of small-pox near these hospitals which has been so uniformly subsequent to their being brought into full working, has also been consequent on it.

We have next to inquire to what extent this is due to preventible causes, and specifically how far to what we have called "personal communication," and how far to what is called "atmospheric dissemination."

10. *Hospitals whether Centres of Infection by their Incidents.*

That the personal communications of a hospital are capable of propagating, and unless carefully regulated are certain to propagate smallpox is obvious.

The following appear in evidence as modes by which this propagation may be supposed to take place: (1) The transit and arrival of conveyances employed to bring sick persons to the hospital; and (2) still more, perhaps, of such persons arriving in omnibuses or on foot; (3) the return home of friends visiting sick patients, and of tradesmen or others having business in the hospital; (4) the despatch of letters insufficiently disinfected; (5) communication of officers, attendants, and nurses with the neighbours; (6) exposure of infected bedding or clothing, to which may be added, perhaps (7), imperfect sewer arrangements which allow the escape, along the line of a sewer, of floating infection. We take these elements of danger in their order.

1. Ambulances.—We cannot ignore the fact that a certain amount of risk must be supposed to attach to the passing of ambulances containing small-pox patients through crowded streets. This danger, however, with proper precautions, may probably be reduced to a very small one. No evidence has been produced before us in proof that small-pox prevails in the streets actually traversed by ambulances more than in other streets in the same neighbourhood. And, granting a certain possibility of mischief, it remains indispensable, for the safety of the whole community, that many small-pox patients should be sent away from their homes, and the risk, such as it is, incurred.

That ill-managed ambulances propagate disease by the admission of friends into the carriage, by the neglect of disinfection, and by loitering at public houses at the entrance of the hospital and elsewhere, is not only possible, but evident. There is distinct testimony to the slovenly and ignorant modes of conveyance which are sometimes resorted to, doubtless with equal injury to the patient and to the neighbourhood in which the carriages and their occupants hang about.

Of this we give the following recent instances. This is the evidence of Mr. Jebb :—

167. Just to give the Commission some idea of the manner in which these patients are conveyed to our hospitals, I should like to read a report from the committee of the Deptford Hospital, dated 26th November, 1881, which is in these terms :—

“ At the last meeting of the committee, the medical superintendent, Dr. McCombie, made the following report, viz. :—

“ ‘ On November 13th, at 12.30 a.m., the Lewisham ambulance arrived here with two patients suffering from small-pox ; one was a woman, the other a baby, aged four months. The baby was suffering from confluent small-pox complicated with laryngitis, and was very dangerously ill. It has since died. The mother of the child accompanied it in the ambulance ; she was very drunk, and she had, the adult patient informed me, let the child slip down frequently on the journey. The sister of the adult patient sat outside with the driver in order to direct him to the hospital.

“ ‘ The driver was very drunk. When he got off his box he staggered about, and fell and broke his leg. The adult patient informed me that he drove at a gallop nearly all the way from Lewisham ; that the door of the ambulance flew open, and she was nearly thrown out.

“ ‘ It was with the greatest difficulty that the driver could be got to stop ; however, with the aid of a policeman and the girl on the box, this was effected, and the door shut.

“ ‘ The ambulance was taken to the Lewisham Union in charge of two of our porters, with the driver laid on the bed inside.’ ”

And this is the evidence of Mr. Archer Farr :—

1890. I may mention several instances ; at the entrance to the small-pox hospital the gates abut close upon the main thoroughfare, so that when the ambulance draws up, while the porter is coming to admit the patient the ambulance projects into the road. I know one instance where a gentleman contracted the disease through not knowing what the ambulance was, and out of curiosity looked in at the open window to see what was there ; he saw a person with the eruption of small-pox upon him, and he was taken ill of small-pox after the usual period from this day.

1891. Upon Easter Tuesday last the ambulance was conveying a small-pox patient through our parish, and the patient becoming refractory, the assistance of a passer-by was solicited. He did not know what was the matter with the patient ; about 12 days after that the eruption appeared upon him and he died. Two or three other cases resulted from that one. I may mention this as showing that there ought to be always some attendant upon the patient.

1893. . . . Then I may mention upon another occasion I was at Stockwell Hospital, about six or eight months ago, and an ambulance drew up at the same time I was there ; the patient, through some mistake was driven to the door of the fever hospital, when it was discovered that it was a case of small-pox, upon which he was taken to the small-pox hospital, which was close by. I saw the patient in the ambulance ; it was a child accompanied by its mother ; it was an ordinary invalid carriage, the ambulance being driven by a youth about 19 or 20 years of age. I questioned the youth as to whether he had been re-vaccinated, and he said “ No.” I then asked him “ Have you had small-pox ? ” He replied “ No.” Then I asked him “ Do you always drive the ambulance ? ” and he said “ Not always ; sometimes.”

On the contrary, the transport by ambulance to a wharf opposite the ship “ Atlas ” off Greenwich is effected by the Metropolitan Asylums Board under admirable arrangements in respect to promptitude and efficiency. A case of small-pox is or ought to be at once telegraphed to the Board’s office in Norfolk Street, which is in telephonic communication with a station, where ambulances, nurses, and medical appliances are always at hand. Twenty minutes after the receipt of the telegram, it is calculated that one of the Board’s Ambulances is on its way to the patient with a trained nurse and such stimulants or other necessities as the case may require, and once placed in that ambulance the patient is under the medical treatment of the Board. To prevent loitering or chance communications the driver wears a uniform, Jebb, 167.

Currie, 268.
Tripe, 578.

and the police are instructed to watch his behaviour and report any misconduct which in the slightest particular is severely noticed. We do not find it stated that the disease has spread either from the ambulances or from the station where they put up. Proper arrangements are of course made for the patient's easy transfer from the ambulance to the vessel which is to be his river conveyance, and from thence to the "Atlas."

Appendix F.

This system, however, is as yet only applied to part of London. The arrangements made by different workhouses are, as might be supposed, various—sometimes good, sometimes very bad—but were they better than they have been, we think it indisputable, both for the good of the patient and the safety of the public, that a uniform efficiency should be secured, and, with this object, that the whole system of ambulance communication should be in the hands of the hospital authorities who have shown themselves capable of conducting it efficiently. And this was the opinion of every witness who was examined on the subject.

Appendix II.
§ 3.
Bridges, 609,
617.

The question whether the ambulances should be allotted to the different hospitals, or collected at a central station, may well be left to the hospital authorities who will also doubtless consider whether by an improved construction of their conveyances, the escape of infectious matter may not be rendered almost impossible.

2. The arrival of patients in omnibuses, in hired vehicles, or on foot, which occurs on a sufficiently large scale to be a clear occasion of mischief, ought certainly to be stopped as far as possible; and will be reduced within the smallest practicable limits by making compulsory the prompt notification of all sickness and the immediate removal of the patients in the hospital ambulances.

3. The friends of patients are only allowed to visit them in case of dangerous sickness or approaching death. The rules to regulate their admission and to prevent their taking the disease home or catching it themselves seem very carefully framed.

Part of them are thus summarised by Mr. Bostock:—

Bostock,
1260.

"We found it impossible to prevent a wife visiting her dying husband, or mothers visiting their dying children, and as regards such visits, the rule is that the visitor is obliged to wear a wrapper completely enveloping him or her; the visitor is obliged to sit at a certain distance from the patient, not to touch the patient or the bed clothes, and the visit is limited to a quarter of an hour. Only one visitor is allowed to each patient, and when they leave the hospital the visitors wash their hands and faces, which have been exposed, with carbolic soap and water."

In illustration of these rules, and of the dangers caused or capable of being caused by their neglect, we quote the account of a Rotherhithe case given by Dr. Browning:—

Browning,
4219, 20, 21.

"I sent a man to Deptford Hospital with semi-confluent small-pox; he was sent away upon the second day after its appearance; the usual sanitary measures were taken, and his wife who was away in the country at the time, was written to; she came back within two days afterwards, and received a letter to the effect that her husband was dangerously ill, and that she had better come and see him; she went, wearing the jacket of one neighbour, the shoes of another, the petticoat of a third, and the skirt of a fourth, and she stayed the whole afternoon sitting at the bedside of her husband, his head resting against her breast; of course, her clothes were thoroughly infected with the poison of small-pox, she came back, and I, hearing of it casually that evening, was able to send round and seize these articles and disinfect them forthwith.

"Did any spread of the disease occur in consequence?—The wife caught the small-pox from going to the hospital, and she did not catch it, undoubtedly, from her husband, because she was away in the country at the time.

"(Sir R. Alcock.) I suppose it is a rare case where such close contact is allowed?—No, you would say not if you saw so much of these working classes as I do.

"(Mr. Pemberton.) But it would be a rare case to occur where people would visit the hospital dressed up in other people's clothes?—No, it is not, indeed; they want to go tidy, and

throw their friends' clothes just as freely as you gentlemen here would exchange pens or paper at this table."

With regard to the clothing there is no reason for supposing that the hospital precautions were in this case ineffectual, though Dr. Browning's statement as to the habits of the poor illustrates the necessity of extreme care in the enforcement of the rules. But it is plain that the rule respecting contact, Rule V. (which is not quite so positive as Mr. Bostock believes it) should be more peremptory and should be strictly enforced.

Bostock,
1260.

In some of the hospitals inquirers, tradesmen, workmen, and others, are obliged to enter the hospital through the same entrance which is used for the arrival and removal of patients. This clearly gives occasion for propagating the disease. The entrance and exit for the patients and ambulances (which should never be allowed to wait outside the hospital gate) should most certainly be quite distinct from the administrative entrance and waiting rooms.

Bridges, 628.
Bernard,
3275, 3279.
Gayton, 2654.

4. It is conjectured, though not on very certain grounds, that in one case small-pox was conveyed to Dublin by a letter insufficiently disinfected, and it is said that a nurse was induced to get money for postage stamps which had been handled by a patient. These allegations or suppositions we merely mention to illustrate the minuteness of regulation which is necessary to secure safety.

Sweeting,
5218.
Gayton,
2656.

5. The rules which regulate the communication of the nurses and attendants with the neighbourhood appear to give undue occasion for the spread of infection. Nurses in particular are allowed to leave the hospital precincts every day. With such constant incomings and outgoings it must be extremely difficult to secure in every case a proper disinfection of the person. And it would seem very desirable, if possible, to allow of longer absences—say of one or two days—at longer intervals—say once a week or a fortnight.

Sweeting,
5211-5214.
Dudfield,
1473.
Gayton, 2652.
Currie, 5437.

6. The danger of exposing infected bedding or clothes is so obvious that it is provided for by regulations and can only take place by neglect of them. Such neglect may of course have occurred among those oversights which must inevitably occur in launching a fresh machinery, before experience has developed the necessary regulations, and while officers and servants are new to their work, and insufficiently alive to the importance of the rules which they have to observe.

Thorne, 1057.

7. Suspicions are expressed respecting the present sewer arrangements at Beckham, and as to the past arrangements at Homerton. On these, however, we can express no opinion. They are of course matters always deserving the greatest watchfulness.

Tripe, 2241.
Bristowe, 524.
Farr, 1900-7,
1907.

In future all these opportunities of infection may doubtless be greatly reduced by the improved methods which experience is suggesting, and will continue to suggest. In the past they have certainly had a large share in increasing disease at the hospital. Whether they alone furnish an adequate explanation of it is a question to which we next proceed.

Gull, 4344

11. *Hospitals whether Centres of Infection per se.*

In this view it follows to consider whether a closer examination of the recent history of small-pox gives ground for believing that some agency beyond personal communication has been at work, and that large hospitals are a source of danger not only in their incidents, but *per se*, by disseminating infection through the atmosphere.

And here, perhaps, we may properly notice one or two conditions of this inquiry which, though obvious, are not always borne in mind.

It is well known that small-pox, though generally susceptible of control by

Jenner, 5331. careful regulations rigidly enforced, has an almost unique power of propagating itself by unexpected and untraceable methods—availing itself with a kind of penetrating subtlety of all the varied means of communication in use among mankind. Those, therefore, who have to measure the effect of a suspected cause of small-pox have to disengage it from innumerable cross currents of latent accident, for which it is impossible to make fitting allowance, and which can only be eliminated by taking a basis of induction so large that these accidents may be expected to average themselves. We have seen the effect ascribed in many cases by experienced officers to a single case of concealment. One such case, producing—as one did produce—16 deaths and occurring—if it could have occurred—in the non-epidemical year 1875, when the small-pox mortality of London was only 46, would singly have increased the metropolitan death rate on that year by more than 30 per cent. And thus the perversity of a single parent, the disobedience of a child, the carelessness or ignorance of a tailor or laundress, the negligence of a parochial ambulance driver, a breach of regulation by hospital officers, the apathy of a medical officer of health, or even an incautious arrangement of his visits by a medical attendant—one or more of these occurring during a period of exceptional susceptibility, or in a locality where vaccination was exceptionally imperfect, and taking occasion of a school feast, a social or public meeting, or any other occasion which multiplies contact, might produce such effects as totally to destroy the value of any average or percentage which was effected by them. Events of this kind are always disturbing or vitiating the evidence on which conclusions respecting the spread of small-pox must be based.

Again, on similar grounds, we conceive it to be very unsafe to assign a case of small-pox to any cause which is not acknowledged to be effective in its nature and which have actually existed in the particular case, only because we cannot assign it to any other. Sometimes, indeed, it may be said that personal communication is absolutely impossible, but, as a general rule, the occasions of such communication between man and man are so various, so many are forgotten, so many concealed, so many unknown or unthought of, that we cannot safely use negative evidence on such a point for the establishment of a theory, unless it can be obtained on a large scale and with a uniform direction.

Proceeding on these principles, it will be seen that in crediting the hospital with the disease which has increased round them, we take no notice of separate cases or outbursts. In particular we lay no stress on an outburst in a street called Ifield Road, which has occasioned much controversy in relation to Fulham Hospital. The first case or cases which occurred in that neighbourhood may or may not have been due to the hospital. The matter is one at best of probable conjecture. But a very peculiar amount of sickness in any particular street beyond all those which surround it must have some accidental or normal cause peculiar to that street, and the neighbourhood of the hospital was not peculiar to Ifield Road. It is in the continued recurrence, under similar circumstances, of similar phenomena, without the presence of any general cause, other than the hospital, which is capable of accounting for that recurrence, that we must seek a valid reason for the conclusion at which we may arrive.

And here we will also observe that it must not be supposed for a moment that, as an occasion of disease, the presence of a hospital bears any sort of comparison with the other deleterious influences from which London suffers. This is evident by the inspection of some maps of London with which the Metropolitan Asylums Board have been good enough at our request to furnish us, in which the incidence of small-pox from time to time in every part of London is exhibited in

detail, so far as it makes itself known to the hospitals by the number of cases admitted from each district. These maps, taken in connection with the returns which the Board have also supplied to us, are the only guides which we have to the amount of small-pox, as distinguished from that of mortality, which has prevailed in different parts of London during the successive epidemics of the last 10 years; and they will, we believe, furnish invaluable aid to those who wish to pursue their studies into the history of this disease, especially if it be found practicable to continue them. They show that a healthy neighbourhood in which a hospital has been planted, though to a certain extent injured, may yet be favourably compared as regards prevalence of small-pox with those localities in which from over-population and neglect of sanitary precautions the predisposing causes of disease are more deeply seated.

The preceding observations respecting the effect of accident are, we think, relevant to the question on which we are now engaged, namely, whether, independently of personal contact, the hospitals diffuse infection round them through the atmosphere? Here, as before, the averages or percentages on which we have to rely are based on numbers so small as to leave us very much at the mercy of accidental disturbance, and our conclusions must be based on numerous converging coincidences.

It is undisputed that actual contact with a small-pox patient, or with a body which has been in actual contact with one, is not necessary for the propagation of the disease, or, in other words, that the infective matter of small-pox spreads at least a few yards through the atmosphere. We have to inquire how far at the utmost the infection can spread, and under what conditions it can spread beyond the generally admitted distance; and unfortunately in the present state of ascertained facts it is not possible to give a conclusive answer to either of these questions.

Respecting the distance to which infection may spread the evidence will, indeed, show that the opinions of those who have most studied the subject vary from a maximum range of 10 yards to that of one or two miles. And when we have asked the practical question, What breadth of ground should be left open round a hospital in order that its neighbours may be in a state of reasonable safety from its effects?—we have received answers ranging from 16 or 24 feet to half a mile. So also with regard to the conditions under which infection may spread most widely—of which conditions the number of cases collected together is by many regarded as of most importance. If we endeavour to ascertain what number of small-pox patients may be treated in the same hospital without appreciable effect on the health of the neighbourhood, we find that Sir W. Gull considers that 20 acute cases are a large number to have in a hospital. Mr. Bostock and Dr. Gayton think that 50 or 60 would be safe or tolerably so. If the cases are not acute but mixed, Dr. Bridges, Mr. Bostock, Dr. Munk, and Sir James Risdon Bennett incline to a maximum of 100. Dr. Tripe, who has carefully watched the working of Homerton Hospital, declares that no mischief has occurred there while the number of (mixed) cases was under 80, and suggests a limit of 100 or at most 150. The larger of these numbers is also suggested by the Society of Medical Officers of Health, while Sir W. Jenner strenuously protests even against the smaller. Even those authorities who are disposed to reject the idea of distant atmospheric dissemination are not generally disposed to exceed a maximum of 150. All these questions are raised by the report of Mr. Power, which we have already noticed, and which has acquired so much importance that we have thought it proper to place it in the Appendix with the reports of Dr. Bridges and Dr. Thorne Thorne, which have a material bearing on this subject, and to add here a statement of what we conceive to be the leading

Bridges, 677,
808.
Power, 911-
13.
Dndfield,
1557.
Tripe, 582,
2212, 2230.
2291.
Gull, 4312,
4345, 4365,
4460.
De Chaumont,
2443.
Gayton, 2662.
Munk, 4632,
4693.
Bennett, 4841,
4916.
Squire, 5024.
Jenner, 5339,
5364.

Gull, 4465.
Bostock, 1312.
Gayton, 2701.
Bridges, 673,
716.
Bostock, 1404.
Munk, 4713.
Risdon
Bennett, 4960.
Tripe, 2186,
2238, 579.
Appendix E.
Jenner, 5375.

arguments for and against widely extended atmospheric dissemination, so far as they are founded on such facts as have been given in evidence.

The table in which Mr. Power exhibits the distribution of small-pox round Fulham Hospital during the five recent epidemical periods appears in an earlier part of this report; but we repeat it here for convenience of reference.

ADMISSIONS of ACUTE SMALL-POX to Fulham Hospital, and INCIDENCE of SMALL-POX upon HOUSES in SEVERAL DIVISIONS of the Special Area (of a mile radius of the Hospital) during Five Epidemical Periods.

Cases of Acute Small-pox Admitted.	In Epidemic Periods since Opening of Hospital.	Incidence on every 100 Houses within the Special Area and its Divisions.				
		On Total Special Area.	On Small Circle, $\frac{1}{4}$ Mile.	On First Ring, $\frac{1}{4}$ - $\frac{1}{2}$ Mile.	On Second Ring, $\frac{1}{2}$ - $\frac{3}{4}$ Mile.	On Third Ring, $\frac{3}{4}$ -1 Mile.
327	March, 1877, to end of 1877	1·10	3·47	1·37	1·27	·36
714	January, 1878, to September, 1878... ..	1·80	4·62	2·55	1·84	·67
679	September, 1878, to October, 1879... ..	1·68	4·40	2·63	1·49	·64
292	October, 1879, to December, 1880	·58	1·85	1·06	·30	·28
515	December, 1880, to 2nd April, 1881	1·21	3·00	1·64	1·25	·61
2,527	Five periods	6·37	17·35	9·25	6·16	2·57

Appendix M.
Tables
Va, Vb, Vc,
Vd.

Power, 5461.

The fact that the unhealthiness of the special area, as shown in the third column of the above table, varies almost exactly with the activity of the hospital: as shown in the first column is adduced as showing that the hospital is in some way or other a centre of infection. In the series of detailed tables of which this is a summary, and which exhibit these variations of unhealthiness fortnight by fortnight, the exactitude of this correspondence is not sufficient to support, nor the inexactitude to impair, the force of Mr. Power's argument. Allowing 14 days for incubation, and comparing, therefore, the admissions of acute cases during each fortnight with the houses invaded by small-pox during the next, it would not appear that the increase or decrease of admissions corresponds with the increase or decrease of invaded houses in much more than two thirds of the recorded fortnights. But it results from another table which Mr. Power has laid before us, and which also will be found appended to his evidence, that if we compare the sickness of the neighbourhood fortnight by fortnight, not with the admission of acute cases to the hospital, but with the number of such cases from time to time under treatment there, the correspondence is much more constant; and we find that for thirteen weeks the sickness in the neighbourhood of the hospital, except in one case, increases or decreases (often, it is true, very disproportionately) with the number of cases on low diet, and, therefore, presumably acute, that is, not yet convalescent. And this, it may be said, is more material to the belief in atmospheric dissemination than a correspondence of disease with admissions, because it seems to point to the hospital's intrinsic power of generating contagion more directly than to its external operations.

But what is, at first sight, still more imposing is the law which the injurious influence of the hospital appears to obey.

In five successive epidemical periods we find here the same recurring phenomenon—concentric circles of diseasedness round the hospital, diminishing gradually in intensity as they recede from the centre. It is a remarkable concurrence. Its curious regularity bears with it (as Mr. Power remarks) the appearance of a natural law rather than of a result of accumulated accidents, and impresses the imagination

with the idea of an expanding wave of infection, issuing from a focus of disease and passing as it enlarges itself.

And this "graduated intensity of infection," to borrow Mr. Power's phrase, was found not only in the ordinary working of the hospital, but in a singular outbreak of small-pox in the neighbourhood of Fulham Hospital, which took place in the end of January, 1881, which seems, in its circumstances, to call for some special explanation, and which was closely studied by Mr. Power.

Between the 26th and 30th of that month (to select what is most material) 12 parishioners were attacked, of whom 40 were resident within a mile and a half, and 32 within a mile of the hospital; and in regard to 23 of these last "there was scarcely a hint to be got to account for their illness." In this exceptional visitation, therefore, the normal graduation of disease round the hospital was maintained, while two thirds of the cases could not be accounted for by any ascertainable communication with it, or by any other known channel of infection by contact.

In order to fix the value of this negative evidence, Mr. Power enquires what were the hospital communications which in point of fact took place during the six important days from the 12th to the 17th of January, and whether they were adequate to account for the 23 unexplained cases of small-pox which appeared a fortnight afterwards between the 26th and the 30th.

He finds that the known occasions of personal communication between the hospital and the district around during these six days were in all 439, including the arrival and departure of 18 ambulances, and observes truly that these "seem to suggest many opportunities for spread of infection." But he points out that a multitude of them may be at once dismissed as incapable of producing any effect, or most unlikely, under the circumstances, to have done so, and satisfies himself by a most careful examination of each known class of communication, that the residuum is "insufficient to explain the demonstrated influence of the hospital on the district surrounding it."

It is very difficult to estimate the value of Mr. Power's analysis, and it would, therefore, be useless here to reproduce it. We will only say that it is very careful, but that it must be accepted subject to all that we have said respecting the extent to which small-pox is capable of being propagated through unexpected and indiscernible channels.

On the whole the following appears a fair *resumé* of the case for atmospheric dissemination founded on the evidence brought before us; in giving which we adopt freely Mr. Power's language.

We find in each epidemic period an excessive incidence of small-pox in the neighbourhood of the hospital, as compared with that at a distance.

Comparing epidemic with epidemic we find that the aggregate incidence varies with the amount of hospital operations.

Analysing the incidence we find that the proportion of houses invaded by small-pox decreases as they are more distant from the hospital, with a regularity strongly suggestive of a natural law.

And examining the incidence from fortnight to fortnight we find that the number of cases of small-pox arising in the neighbourhood varies generally with the number of acute cases under treatment in the hospital.

In a special and carefully studied outbreak of disease, we find a large number—an unusually large number it is said—of independent cases which cannot, after the most minute inquiry, be connected with the personal communications of the hospital, or with any other source of infection by contact, and particularly that the houses on

the lines of human intercourse have not suffered more than other parts of the same neighbourhood.

Lastly, we have in atmospheric dissemination a vehicle of contagion of admitted potency within a certain range, and capable, if we suppose that potency to have been hitherto underrated, of producing exactly all these results.

On the other hand, against a belief in widely extending atmospheric dissemination, it may be urged—

That the number of facts supporting it is, at present, too small;

That the chief of these facts have been observed in the case of only one hospital;

That the evidence in disproof of sufficient personal communication in the neighbourhood of this hospital is necessarily very negative and incomplete;

And that the immunity of persons living near small-pox hospitals, if guarded from all, even indirect, personal communication with their inmates, is quite inconsistent with the belief in infection by particles carried far through the air.

The following are instances of this immunity:—

Bridges, 628.
Collie, 2164.

The City of London Workhouse, which overlooks the Homerton Small-pox Hospital, and is distant from it, window to window, only 90 feet, had scarcely any cases in the epidemics of 1871 and 1877, when the disease was extremely prevalent in the surrounding streets, although at that time the inmates were not protected by re-vaccination. The same may be said of the Hackney Union Workhouse and Infirmary which are about a quarter of a mile from the Homerton Small-pox Hospital, and therefore well within the area supposed to be affected by aerial contamination.

Bridges, 673.

At Highgate the Central Sick Asylum Infirmary, with 400 or 500 inmates is within 200 feet of the Small-pox Hospital, and there has been very little small-pox there, certainly not more than at other poor law infirmaries remote from hospitals. At the Holborn Union Infirmary, Highgate, distant about a quarter of a mile from the Hospital, such cases as occurred were traceable to the visitation of friends.

Collie, 241,
4281.

At Homerton the Fever Hospital and the Smallpox Hospital are in close proximity within the same enclosure, but very few instances have occurred in which fever patients or convalescents have contracted small-pox. In 1876 it became necessary to receive small-pox cases into the Fever Hospital, and for some time there were fever cases at the west end and small-pox at the east end, but there was not a single case of small-pox among the fever patients, and not a single case of fever among the small-pox patients.

Power, 909.

One point appears to have made so much impression on several important witnesses that it should be specially noticed. Mr. Power, himself, clearly perceived and fully admits that the graduated distribution of disease around the hospital which is so remarkably illustrated in his report, is as explicable by personal communication as by atmospheric dissemination. “*With such a hypothesis,*” he says meaning that of dissemination, “*equally as with a hypothesis of conveyance by human movements the gradation of hospital influence from centre to periphery would be in complete accordance.*”

The admission is so material that it ought to be developed. Let us replace the image of a wave, which is suggestive of one hypothesis, by an image equally appropriate, but adjusted to the other. Instead of an expanding wave let us imagine a number of converging and diverging lines of infection. It is plain, in the first place, that along these lines—the lines of hospital communication—the in-

coming and outgoing of persons and things would offer more occasion of disease wherever these persons or things were likely to pause in their route, and by consequence more in the immediate neighbourhood of the hospital than farther off. But disregarding this effect of propinquity, and supposing that one quarter of a mile is as fruitful in occasions of contact with the carrier of infection as another, let us imagine that, on the different lines of communication which radiate to and from the hospital, infection is shed equably along the whole of their courses, and is represented on a diagram by black lines, varying in breadth according to the amount of infection which is dispersed, and in length according to the distance along which it is carried. It does not need the actual inspection of such a diagram to perceive that the effect of these lines in blackening each successive hospital ring will constantly increase as they close in on the centre; or, in other words, that the converging incomings and outgoings of the hospital would produce exactly that "graduated intensity of infection" from which, prior to reflection, we are tempted to infer an expanding wave. The argument is capable of arithmetical statement, and it would be easy, if it were worth while, so to exhibit it.

We think it right thus to report the chief grounds for accepting or rejecting the theory of distant atmospheric dissemination of small-pox. But we feel that so long as it is not proved that "personal communication" is adequate to the explanation of the whole spread of small-pox, and so long as distant "atmospheric dissemination" is not shown to be in the highest degree, improbable, so long it is essential that in the construction and management of small-pox hospitals both sources of danger should be, with the utmost care, guarded against. And in this conclusion we are more than supported by the opinions of witnesses of the greatest authority, including Sir William Jenner, Sir William Gull, Sir James Ridson Bennett, and Mr. Simon.

Bridges, 677,
808.
Power, 911-13.
Dudfield, 1657.
Tripe, 682, 2212,
2230, 2291.
Gull, 4312, 4346,
4365, 4460.
De Chaumont,
2443.
Gayton, 2662.
Munk, 4632,
4693.
Bennett, 4541,
4916.
Squire, 5024.
Jenner, 5339,
5364.

12. *Distribution of Small-pox patients.*

Having arrived at this conclusion, it is well to pause for a moment, and to point out clearly the conditions under which we have to choose our course in the distribution of small-pox patients.

1. When a small-pox patient will be satisfactorily isolated by those about him, no question arises.

2. When this is not the case, but the patient is too ill to be moved, he must necessarily be treated where he is, and the best isolation possible provided on the spot.

3. When the patient can be safely sent several miles by land, it is on every ground desirable that he should be sent to some hospital at a distance from London.

4. When the patient cannot safely be sent so great a distance, we are placed in this dilemma. It has been shown that in any considerable epidemic there may be 400 or 500 persons in this condition to be provided for. If we collect them in four or five large metropolitan hospitals we give serious cause of complaint to the localities in which they are placed. If we determine, as has been suggested by some witnesses, that each parish shall bear its own burden, we necessitate the sudden establishment on occasion of every great epidemic of 30 or 40 institutions, in a great measure extemporised, each of which will be extremely expensive, both in construction and management, in proportion to its number of patients; some of which will certainly be ill managed, and all of which, in proportion to their defects of mismanagement, will be effective *foci* of infection.

5. Some of the evidence which we have received raises the question whether this very serious difficulty may not be reduced within manageable limits by treating part of the severe, but not of the severest, cases, on or near the River Thames, and by dealing with the rest in a few small hospitals, of improved construction and management, in connection with the fever hospitals, of which we shall presently have to speak, or elsewhere.

13. *River Hospitals.*

The sinuosities of the Thames as it passes through London afford remarkable facilities for draining the city of disease, if only they can be turned to account. Between Greenwich and Battersea Park bridges, distant as the crow flies about six miles, there are on the two banks of the river 16 or 18 miles of water frontage. And if between these limits two lines be drawn east and west, one a mile north and the other two miles south of Blackfriars Bridge, it will be seen that of the whole enclosed area, amounting to 18 square miles, and including much of the most densely peopled parts of London, a mere insignificant portion is more than a mile's distance from the river.

The proposal to treat small-pox patients on the river or on its banks is made by Sir William Jenner, by Sir Edmund Currie, who had close experience of the hospital ship "Dreadnought," and as a manager of the Asylums Board has taken special charge of the ship "Atlas," and by Dr. Gayton, for 11 years medical superintendent of Homerton Hospital and now acting medical superintendent of the "Atlas." The following is the opinion of Sir William Jenner :—

5339. . . . The scheme that struck me as the right one (I do not know whether it has been proposed here) was, that the hospitals should be built in Kent or Essex down the river, and that those patients who should be removed should be removed by ambulance so constructed as to jar the patient as little as possible, to which I attribute great importance in all febrile affections. There should be a separate pier from which ambulances should be passed on to the ambulance barge and be towed down the river. That is the only way, as it appears to me, in which you could move the patient to a distance with safety. The very worst cases, incapable of being removed, should be kept by the parish in the immediate vicinity of their own houses where they are seized with the disease, and as soon as they become convalescent they would be towed down the river or carried down in a steamer, though I should prefer their being towed, because of the jar.

This recommendation it is to be observed applies to all but "the very worst cases." Its object is to isolate, and it assumes that healthy and uninhabited sites can be found on the banks of the Thames.

Sir E. Currie speaks thus :—

Q. 265. . . . The Local Government Board were anxious upon the question of the patients going a long distance to the ship, whereas I held that the treatment of the patient begins directly he gets into the hospital boat alongside the wharf, and whether you take the patient 2 miles or 17 miles, so long as you have the nurse, the stimulants, the appliances, and a proper boat to put him in, makes no matter. We now have to carry our patients about London a great many miles unfortunately, and I hold that it would be better to take them 17 miles down the river than to drive as they do now about London a great many miles, and thereby running a great risk. I am anxious to impress upon the Commission that not simply is this the view of our committee (who are utterly opposed to the place where the ships now are), but that they think the greatest benefit might arise to London if some 70 per cent. of the patients were dealt with in that way instead of being taken to the shore hospitals, which ought to be confined only to acute cases. I speak from no slight knowledge upon the subject, because I was in charge of the "Dreadnought" in the 1870 epidemic, when it was used for convalescents, and consequently saw what took place then; and I feel morally sure that 70 per cent. of the patients might safely be taken down the river, and treated

upon the river instead of being dragged through the streets of London. . . . I may say that we are obliged to have a wharf, which of course is an extra expense, and we had the greatest difficulty in getting any wharf alongside the river. But we at last secured a wharf at Millwall, to which the patients are brought, and we have two steam launches, one of which the Government lent us, and the other we purchased; and these launches are used together with hospital boats which we have had specially constructed, into which the patient is able to be carried on a stretcher, and when he gets inside he finds couches which the stretcher is put upon with a nurse in attendance, all sanitary arrangements necessary, and stimulants, and indeed everything that is required. The patient comes to the wharf in an ambulance; a signal is made from shore that there is a patient, and in less than 3 minutes the hospital boat comes from the ship alongside, and the patient is taken on board.

It should be pointed out that Sir E. Currie's experience does not apply to what he describes as "severe" cases, which he assumes will be treated on shore. But it does apply to persons ill enough to need to be carried on stretchers.

And this is the evidence of Dr. Gayton :—

2695. . . . I do not think there should be much difficulty in the transfer of patients from any part of London to the ships wherever they may be situated, as, for example, supposing the vessels are moored off Greenhithe, or any other distant place selected as suitable, I should suggest that the patients be still brought to the ferry now engaged, in ambulances suitably constructed; and here I would always have stationed a steamer of considerable size and power, and on it a cabin capable of holding, say, a dozen beds, in charge of a trusty nurse, provided with milk, beef tea, stimulants, and other necessaries. The patient upon arrival would straightway be placed in bed, and as soon as the tide began to run down the vessel would start for its destination, another in the meantime having arrived to take its place. In this way twice at least in the 24 hours batches of patients would be dispatched, and their treatment would commence not at Greenhithe, but from the moment they were placed on board the ambulance boat. Removed in this way, I do not think any inconvenience or delay would be found, nor increased suffering be entailed. My present experience would teach that the most painful sensations of the patients are aroused by jolting over the London stones, and it would therefore be an important question to consider whether there might not be a great advantage in having a series of landing stages placed at certain points, and extending from the extreme west of London to or below the present one at North Greenwich. A well-arranged dock appears to afford plenty of opportunity for the construction of an excellent ward and well suited in every respect for the treatment of small-pox patients, and as the amount of fresh air is practically unlimited it leaves little to be desired. I think, moreover, that statistics in a few years will show that cases treated on the Thames have done infinitely better than on land.

2696. You do not anticipate any difficulty in the winter?—Fog and ice may, perhaps, prove troubles of some importance, but the experience of a man who has been engaged as a waterman, as he tells me, for 60 years, would go to prove that not more than about once in five years the latter would prove an obstacle, but as the boats are constructed of iron, and provided with a contrivance for throwing masses of ice on one side, it may practically be left out of consideration; the former would beyond doubt, he thinks, give rise to much trouble and necessitate frequently the postponement of a pre-arranged journey, yet, as a broad rule, he is of opinion that once at least in the 24 hours an opportunity would present itself from getting from Potter's Ferry to Greenhithe or thereabouts without danger and difficulty. We had an illustration of this the day before yesterday; at Greenwich the fog was intense, but still we had no particular difficulty in getting a patient off, and bringing him across safely enough.

2697. That is only just across the river?—Yes, that is so, but the fog was very dense.

2698. As to the treatment on board the "Atlas," is that successful or otherwise?—The experience of it has been so short that it would be unfair to draw any deduction, but, as I said just now, I think in the course of a few years, when statistics come out, you will find that the treatment is much better on the "Atlas" than on shore. Certainly some very bad cases have got well which it was not anticipated they would do.

2699. Upon the whole you treat the patients with greater satisfaction to yourself upon the "Atlas" than at the Homerton Hospital?—Yes, with far greater satisfaction.

It will be seen that while Sir William Jenner desires to establish hospital on the banks of the river, Sir E. Currie and Dr. Gayton contemplate the use of hulk or rafts. We are inclined to believe that Sir W. Jenner's proposal would be best if appropriate and unoccupied sites could be found, and there seems reason to believe that such sites would not be unattainable. Among other advantages, it would have that of taking the hospital quite out of the way of the shipping. Floating hospitals on the other hand, have the advantages of comparative cheapness—if vessels were supplied in the first instance free of cost from the Government dockyards, by which the public could be saved the cost of breaking them up when no longer fit for active service—of inexhaustible capacity, of being easily fitted up and moveable, of exceptional facilities for isolation, and, in the judgment of the medical superintendent of furnishing highly convenient administrative quarters.

Tripe, 2174,
2182.
Gayton, 2716.

The objections to the river treatment are the following :—

Against the advantage of distance in facilitating isolation is to be set its disadvantage when the visits of friends are really desirable. But it must be remembered that the dangerous cases, in which alone such visits ought to be allowed, will most usually be treated in the London hospitals.

There is some difficulty in finding a healthy part of the river in which a floating hospital can be placed in the neighbourhood of any landing place, without obstruction to the navigation of the river or risk to itself. But near the spot which is actually proposed in Long Reach the reformatory ship "Cornwall" is moored without alleged injury to the health of its inmates or inconvenience to the shipping, and, with the assistance of a launch, communications could easily be maintained with a somewhat distant landing place.

It is suggested (as we have seen) that the communication with London might be occasionally suspended by ice or fog. And the latter is, perhaps, more likely to prove a substantial inconvenience than Dr. Gayton is disposed to admit. But the risk though unquestionable is incalculable. London fogs will occasionally be such as to stop the transport of small-pox patients even by land. The risk of keeping them at home, which is thus sometimes unavoidable, would, on these and other rare occasions, be extended over the period during which navigation was stopped, except so far as it could be supplied by increased use of the land hospitals.

Lastly, the atmospheric diffusion of small-pox which is assumed to render land hospitals dangerous to the neighbourhood would not, if real, be absolutely without risk to ships passing near the floating hospital. This cannot wholly be denied. But we need scarcely point out how much the case of a vessel passing within 50 or 100 yards of a hospital in an open tideway with a free movement of air around differs from that of a multitude of persons living constantly within range of infection; and we have not heard of any cases of small-pox among the shipping, having been imputed to the "Atlas" in the port of London. Having, by the nature of the case, to choose between alternative risks, we believe that the general good will be best consulted by establishing a machinery which will clear the metropolis of the disease without planting a centre of infection in a thickly peopled neighbourhood, though with the bare possibility that it may cause an occasional case of small-pox on the river. This possibility would be still further reduced if the hospital can be placed, not in the stream, but on the river banks.

On the whole we can hardly doubt that with the requisite Parliamentary powers, places of embarkation can be secured at fitting intervals on the 18 miles of river bank on which the choice is to be made. And on this assumption we recommend that hospital accommodation be provided on the bank of the Thames, far

own the river, or, if that be impracticable, on the Thames itself, for such persons suffering from small-pox in its early stages as cannot be safely carried far overland, but may be judged capable of being safely transported to embarkation wharves in ambulances, and down the river in well-appointed hospital vessels.

If this plan be held, or found by experience, to be objectionable, it would probably become necessary to establish a few small district hospitals, besides those connected with the fever hospitals, under the management of the same authorities, and subject to such regulations as will reduce, within the narrowest limits, the risks attendant on them. Even in this case, however, a large hospital placed on the banks of the river, could scarcely fail to be available, and most conveniently so, for mild cases and convalescents.

14. *Fevers.*

We have found it convenient hitherto to deal almost entirely with the subject of small-pox. We now pass on to consider what hospital accommodation is required for fevers; that is to say, for scarlet fever, diphtheria, typhus, typhoid, and enteric fever. And this, though not the most difficult, is perhaps the most really important part of the matter referred to us. The most important part we say, because, in London, not only does the average annual mortality from fevers exceed that from small-pox in the proportion of 12 to 5,* but the consequences which are left behind—the loss of health, activity, sight, hearing, and other faculties, which render life happy and useful, are more lamentable. It is not, however, with these consequences of disease which we have to deal (except so far as it is possible to avert them), but with the hospital accommodation for those who are actually suffering from it. And this might at first sight be inferred to be at least three times what is required for small-pox, as not only are the cases more numerous, but the period of seclusion required is longer, lasting, on an average, eight weeks instead of six.

Collie, 2143.

This conclusion, however, would be greatly beyond the mark. In the first place, however obstinately the infection from scarlet fever clings to things and places, it is far less subtle and energetic in its modes of diffusion, and, while it lasts, more readily kept under control than small-pox. And there is reason to hope that methods now adopted for preventing infection will render the isolation of the disease in private houses much more easy and effectual, and thus reduce the number of persons requiring removal to hospitals.

Again, the outbursts of small-pox are violent but occasional. We have seen that since 1871 the annual mortality has been as low as 56 and as high as 2,544. During the same time deaths from scarlet fever have ranged only from 904 to 3,651, and that of other forms of fever only from 1,176 to 1,746. And experience shows that in fevers the same comparative regularity which prevails in successive years prevails also in successive months.

Thus the pressure on a small-pox hospital is fitful—for occasional months in occasional years—that for fever though not of course equable is yet comparatively so. And as it is for a maximum that we have to provide, this equability will reduce very largely the required scale of our preparations.

* Annual rate of mortality per 1,000 in London for ten years, 1871-80:—

Small-pox	...	...	...	...	...	...	...	46
Scarlet fever	...	...	...	...	...	...	...	60
Diphtheria	...	...	...	...	...	...	...	12
Fever	...	...	...	...	...	...	...	37
Total Fevers	...	...	...	...	...	...	...	109

We cannot affect to balance these conflicting considerations, we can only state the impression of those among us who are best able to judge of the subject, that fevers will on the whole be adequately provided for if we secure the power of supplying 3,000 beds—a somewhat greater number than we have suggested in the case of small-pox.

Another observation has to be made. The witnesses who have been concerned during the last few years with the treatment of small-pox on a large scale concur on the whole in the opinion, that while in some cases the movement of the patient is impossible, and in others only safe for very short distances, yet that with such precautions as those adopted by the Asylums Board this movement is practicable in a greater number of cases and over a greater distance than has been usually taken for granted. But this experience does not apply to fever, whether scarlet or typhoid. In these diseases there is a considerable period during which long removals must not be risked, even in cases that are not very severe. And hence the country hospital will not, as in the case of small-pox, be available for mild cases, but only for the convalescents, and therefore for a far smaller proportion of the whole. It is therefore extremely fortunate that all evidence goes to show that well-conducted fever hospitals involve no appreciable risk to the neighbourhood. This is the testimony as well of the medical superintendents of the Asylums' and other fever hospitals as of the officers of health who are in charge of the districts in which these hospitals exist. Nor have we received any statements of an opposite tendency.

If, therefore, it be determined to discontinue or limit the use for small-pox of the hospitals of the Asylums Board in the neighbourhood of London, all these establishments will remain available for fevers to the full extent to which they are required for that purpose.

And after a careful consideration of somewhat conflicting opinions we are satisfied that under proper precautions a limited number of small-pox cases may without sensible risk of infection, be received within the precincts of the fever hospitals.

We are aware that in making this recommendation we may seem to reproduce in a mitigated form an evil of which we have acknowledged the reality. But in the first place we have been much struck by the extent to which, under the trying circumstances which we have above described, it was found possible to protect fever patients in Homerton Hospital from the small-pox by which they were surrounded and next we find that when cases of small-pox have occurred in contiguous fever hospitals, they are either plainly referable to faulty diagnosis previous to admission or are readily explicable by incomplete separation. To the consequences of faulty diagnosis all hospitals must, of course, remain liable. But those of incomplete separation may be guarded against by physical barriers and by rigid rules inflexibly enforced. Add to this that the fever patients may be re-vaccinated whenever necessary, and that the evil arising from atmospheric diffusion will be reduced within very narrow limits by limiting the number of small-pox patients to 30 or 40 (a maximum number which appears to us justified by the authorities which we have above quoted), even if it is not found possible to remove the danger altogether by an improved construction of small-pox hospitals.

On this subject we request attention to two memoranda furnished to the Commission by two of its members, Dr. Burdon Sanderson and Dr. Broadbent and especially to a mode of ventilation suggested by the former gentleman, which if it prove practicable, may have the effect of destroying all risk from æria

Godwin, 2967.
Murphy, 3007.
Bernard, 3156.
Buchanan,
3780.

Bostock, 1362.

Collie, 4284.
Gayton,
2682-87.
Bernard,
3155.

Appendix A,
§ 1, § 2.

dissemination, by destroying within the hospital all the infective particles with which the atmosphere of those establishments is alleged to be charged.

15. *Practical Recommendations.*

And now it will be convenient to preface our further recommendations by a recapitulation of those which we have already made.

We are of opinion that the provision of hospital accommodation for persons suffering from infectious disease in the metropolitan districts should be entirely disconnected from the administration of the poor law, and treated as part of the sanitary arrangements of the metropolis.

We think that the conduct of the hospitals cannot be better placed than under the management of the Metropolitan Asylums Board, with such changes in their mode of election as shall give the sanitary authorities of London—that is to say, vestries, district boards, and commissioners of sewers—at least an equal influence with the guardians of the poor in the choice of the elective members of the board.

We think that every person suffering from an infectious disease, or those in charge of him, or, if these neglect their duty, the occupier of the house in which the sick person is residing, or if he is a pauper, his medical attendant, should be required by law to notify the nature of the disease to the medical officer of health as soon as they or any of them are aware of it; and that, in the case of non-paupers, the medical attendant should, if it is inexpedient to impose any further obligation on him, be similarly required by law to furnish the sick person, or those in charge of him, with a certificate of the nature of the disease, in the form which we have already suggested, to be by them communicated to the medical officer of health. On every certificate so communicated a small fee should be paid to the medical man who signed it.

If the medical officer after receiving such a certificate is satisfied that the patient can and will be properly isolated, and requisite means of disinfection adopted, the matter will proceed no further.

If he is not so satisfied, and if the sick person is not too ill to be removed, he will notify the case to the Metropolitan Asylums Board; who will thereupon be once and entirely charged with the patient till his complete recovery, and, in particular, will be empowered to remove him at once to one of their hospitals. So far no distinction should be made between paupers and non-paupers who cannot be isolated. But within the hospital those who are desirous of being placed in separate wards should be allowed such accommodation on paying for it. In case of ordinary accommodation, it appears to us a question whether payment should be claimed even from those who can make payment without difficulty.

If the sick person cannot be removed or isolated by those about him, the medical officer will be bound to take all necessary steps for his isolation and generally for the protection of the neighbourhood, with power to clear the house of its inmates. In all cases he will be bound to disinfect the house, and in the case of houses invaded by small-pox, should be empowered to require the re-vaccination of occupants who are not otherwise protected.

We are led by the concurrent evidence of several experienced witnesses to hope that the immediate and complete isolation which ought to be secured by these means will greatly diminish the amount of small-pox, scarlet fever, and typhus in London. With regard to these, and also to typhoid, still further diminution may be anticipated if the attention of the proper authorities is directed to the removal

of all local causes of disease, and to the constant employment by means of disinfection. And we feel bound to repeat our conviction that small-pox would be still further reduced if vaccination could be made more effectual and re-vaccination more frequent. But in what follows we take little or no account of these reductions. How far our recommendations will, from this cause, be in excess of what is eventually found necessary is a mere matter of conjecture. We hope they may prove considerably so. Meantime this uncertainty is a reason for proceeding somewhat tentatively.

Subject, therefore, to what may be expected from the above or other preventive measures, we think it would be advisable that there should be sites and buildings which could without difficulty be made capable of receiving 3,000 fever patients, and 2,100—or by special exertion, 2,700—small-pox patients.

Of the 3,000 fever cases, those in the earlier stage—probably about half—should be provided for in the near neighbourhood of London; the other half—the convalescents—in two or three country hospitals.

The existing hospitals of the Metropolitan Asylums Board, which, in our judgment can no longer be used, to anything like their present extent, for cases of small-pox, should, we think, become in the main fever hospitals. And we think it probable that with the aid of another hospital, which appears to be almost indispensable for the east of London, they would fully accommodate all the cases requiring London treatment.

By these arrangements cases of fever would be adequately provided for.

Of the 2,100 small-pox cases the mild, and with them the convalescent cases, being probably more than three quarters of the whole, should be provided for in two or three more country hospitals.

The remainder, being the severe cases during their acute stage, must be provided for in or within easy reach of London.

For these 400 or 500 persons who, being too ill to take a long land journey to the country hospitals, but at the same time not too ill to be removed from their immediate neighbourhood, cannot or will not be properly isolated by those in charge of them, we think, in the first place, that administrative blocks with a few small wards attached to them might be maintained within the precincts of the fever hospitals, sufficient, in each hospital, for 30 or 40 small-pox patients; that the hospital authorities should divide the metropolis into hospital districts, assigning one to each hospital; and that no hospital should receive small-pox patients except from the district in which it is situated.

This qualification is required not only because the patients will always be such as must be sent to the nearest hospital, but also to obviate, as far as the nature of the case admits of it, the great and natural complaint of those who are in the neighbourhood of large small-pox hospitals, that the infection of the rest of London is poured in upon them.

It is evidently of paramount importance that the areas of the small-pox wards as well as their administration should be rigorously separated from those of the fever hospitals, and further, that their construction should be such as to reduce within the smallest limits the chance of spreading infection. We fully believe that contrivances for this purpose might be devised, and we again call special attention to the evidence on this head which has been furnished to us by Dr. Burdett Sanderson.

This will provide for those cases which cannot be sent down the Thames. But we concur with Sir W. Jenner and Sir E. Currie in thinking that others—and

in years of severe epidemic a larger number—might be sent down the river to hospitals in isolated situations on its banks, or if this is found impracticable, to floating hospitals on the river itself. For this opinion we have already given our reasons.

It is plain that under these circumstances small-pox or fever hospitals supported by parishes or unions, like those at Finchley and Plaistow, will become superfluous and they will probably be disused unless either of them should prove available as hospitals of the Asylums Board. Concerning hospitals supported wholly or in part by charity it was not within our duty to inquire, except in so far as facts observed in them might help to elucidate the questions put before us. It seems only right to record that we received evidence of excellent management both in the Small-pox Hospital at Highgate and in the London Fever Hospital at Islington. We do not doubt that both these institutions have done excellent service to the public by their care of the sick and in diminishing the risks of infection by taking many from houses in which they could not be duly isolated. But we think it very doubtful whether the establishment of other hospitals of the same kind, either as charitable institutions or as places of reception for those who can pay, should be allowed unless they are to be subject to the general but effective supervision of the sanitary authority.

The foregoing suggestions are calculated to meet in some degree the intermittent character of small-pox visitations. If the hospital authorities had only to do with small-pox, they would have to collect a staff on occasion of each epidemic, and, if they did not wish to retain it in idleness, to break it up when the epidemic was past, just as its had effectually learned its work. The experienced officers being thus in a great measure lost, a fresh, and, from the nature of the case, a less perfect machinery would have to be created when the next emergency occurred. The comparatively permanent fever establishments, however, will supply something in the nature of a *cadre*, which it will be comparatively easy to expand by the temporary engagement of fresh officers when the small-pox visitation arrives, and to reduce when it is past.

With regard to matters of detail we have already recommended that the hospital authorities should have the entire control of the ambulances, by which all other modes of conveyance should be as far as possible superseded; that the regulations intended to prevent the communication of infection by visitors should be strictly enforced; that the entrance appropriated to the sick should be entirely separate from that of the tradesmen, contractors, and others; that letters should be carefully disinfected; that the nurses and attendants should not be permitted to leave the hospital except at longer intervals, and for proportionately longer periods; that great care should be taken respecting the exposure of infected clothes or bedding; and that the greatest attention should be paid to the state of the drains in and around the hospital. To all these recommendations, mainly for the protection of the neighbourhood, we attach the highest importance, and in the general interest we express a hope that means may be taken to secure that the unprecedented mass of information which has already accumulated and is constantly increasing in the hands of the asylums' authorities may be so studied and methodised as to become available for the advancement of medical science.

16. *Compulsory Purchase.*

It remains to treat of the acquisition of sites for the establishment of new

hospitals and the protection to be given to the managers of those which already exist.

It is obvious that the hospital authorities should have a statutory power of acquiring such sites as are most healthy and convenient for the patients, and may be used with least injury to their neighbourhood. Else they will be obliged to be satisfied with sites which are less healthy and more injurious. It would seem desirable, however, that the choice of sites by the hospital authorities should not take effect until approved by some board or other authority so composed as to furnish a security against arbitrary or inconsiderate selections.

The terms on which land should be compulsorily purchased for public purposes have been long and carefully considered in other cases, and the result is embodied in the Land Clauses Consolidation Acts. But it is said that the case of the hospitals has peculiarities of its own.

It is urged, in the interest of the community, that the hospital authorities, acting as they do for the public good, and with no view to private gain, are in a different position from a railway or canal company. We see no ground for this contention. It is true that to justify compulsory dispossession at all, some public interest has in general to be established. But the right to compensation arising out of a compulsory sale is simply due to the fact that an advantage has to be purchased, and is a demand of pure justice to be measured by the amount of injury cognisable by the law which is inflicted on the person damnified.

Compensation indeed may, in some cases, be impossible; as when the injury is of a moral or sentimental character or on other grounds incapable of assessment, or where no principle of assessment can be applied which will do full justice to all injured individuals, without doing a far greater injustice to the community. If full compensation is thus practically impossible, the sufferer from an unavoidable injury must be content to bear his loss as one of those which men must sometimes endure for the good of others. But whenever compensation is practicable, we see no reason why the public should be absolved from the duty of making it in full. The interest of a multitude is no doubt greater than that of two or three individuals; but so also is their power to bear the sacrifice by which that interest of theirs is secured.

But the distinction between the case of hospitals and that of railways and canals is made also the ground of an argument in the interest of landowners. It is contended that the rule which limits the right of compensation to those whose land is taken from them is not fairly applicable to hospitals. For it is said truly, that while the neighbourhood of a railway or canal does not, in itself, diminish the value of the adjoining land, the neighbourhood of a hospital—if admitted to be a source of infection—may materially do so.

We receive with great caution the statements which are made respecting the actual depreciation of the value of building land in the neighbourhood of hospitals. Such depreciation, if it exists, may well be due to various causes, among others to the obvious one of overbuilding, and may be found on inquiry not to be peculiar to the immediate neighbourhood of disease. Again, from the most remote times, purchasers have always found it their interest to disparage what they desire to buy. And with this object persons who wish to acquire building land have not failed, as may be seen, to make the worst of a hospital in its neighbourhood. In the present case it will be seen from the evidence that the proprietors also have judged it for their interest to busy themselves energetically in the depreciation, for the moment, of their own property. The panic thus fostered must be allowed to sub-side before we can distinguish what is genuine from what is not. Finally, we observe that when this

panic has not been encouraged, building has continued to push on closer and closer to the hospital boundaries.

But independently of general allegations and popular apprehensions, it has been determined in courts of justice that the existence of certain small-pox hospitals in certain localities has amounted in the eye of the law to a nuisance. We have ourselves been led to the conclusion that large small-pox hospitals in populous neighbourhoods have proved appreciable sources of infection, and although we hope that this danger may be materially diminished by the ameliorations which we have suggested, we are not able to say with confidence how far it will be entirely removed.

We think, therefore, that the rule which confines the right of compensation to dispossessed proprietors should not be applied to hospitals, but that wherever a substantial risk is held to exist—as, for example, within a certain defined distance of the hospital—the depreciation of value which results from it should be a subject of compensation.

Where no substantial danger exists, we do not think that any compensation should be given for what has been called “ideal injury”; that is to say, for a depreciation of value which, though itself real, is founded on an apprehension which is not so.

A public authority which purchases land, purchases, we conceive, all the rights of the vendor, and is at liberty to use its purchase in any way which the neighbours are not entitled by law to prevent, however much by so doing it may reduce the value of those neighbours' property. If the proposed use is a nuisance, the neighbours can stop it. If not, they must endure it. This is the condition on which every man holds or acquires property, and he must not complain of it.

But when a public authority takes a statutory power not only to acquire land *ab invitis*, but to use it in a manner which inflicts on the neighbours an injury against which the ordinary law would guarantee them, it appears to us that this abolition of the legal protection on which those persons have a right to rely, and on the faith of which they may have built houses and invested money, gives in equity a strong right to compensation, subject of course to such objections of impracticability as we have already noted.

We should hope, however, that the question of compensation will present less difficulty than might at first sight appear.

In acquiring sites for hospitals in the country, the authorities might be enabled, if they desire it, to purchase more land than is strictly required for their purpose, with the power of reselling what they will not want, under conditions which preclude the purchasers from objecting to the hospital at any future period.

In London and its immediate neighbourhood no question of damage could arise with respect to fever hospitals, and we should hope that such questions would be equally obviated in respect to small-pox hospitals by limiting their capacity to 30 or 40 patients taken from the hospital district.

The power of arresting the operations of the hospital authorities by injunction should, we think, be taken away. It is incompatible with the public safety that individuals should possess the power of suddenly paralysing institutions which furnish for the time the only machinery for controlling an epidemic. Nor do we think that the hospital authorities should be liable to action for any injury which has resulted from their operations, so long as their operations are conducted with reasonable care. The eventual redress of any substantial grievance will probably be secured by ordinary methods, such as representations made to the Local Government

Board or other executive authority, complaint in Parliament, and actions at law for the recovery of damages in case of injury resulting from mismanagement.

In obedience to your Majesty's commands we have now stated in detail the best opinions which we have been able to form on a subject of no inconsiderable difficulty, and some doubt. We have also endeavoured so to state these questions, which have arisen in the course of our inquiry, as to furnish the easiest means of correcting those conclusions, if they are erroneous. And we have only to express our hope that in one way or the other our labours will not prove unprofitable to those in whose interest they have been required from us.

BLACHFORD.
JAMES PAGET.
RUTHERFORD ALCOCK.
ARTHUR W. PEEL.
E. LEIGH PEMBERTON.
J. BURDON SANDERSON.
ALFRED CARPENTER.
W. H. BROADBENT.
JONATHAN HUTCHINSON.

NATHANIEL BAKER,
Secretary.

21 July, 1882.

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23 FEB. 1929

Metropolitan Asylums Board.

R E P O R T

OF THE

COMMISSIONERS APPOINTED TO ENQUIRE RESPECTING SMALLPOX AND FEVER HOSPITALS.

PRESENTED TO BOTH HOUSES OF PARLIAMENT IN AUGUST, 1882.

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